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Title: Facilities Design Analysis Report Caliente Rail Corridor

Supplier DI #: NRP-R-SYSW-FA-0001-03

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Supplier Date: 05/15/07

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NVM Nevada Transportation Manager Gene Allen
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Subcontractor: Nevada Rail Partners	Item Number/Title/Revision: T10/Facilities - <i>Facilities-Design Analysis Report, Caliente Rail Corridor</i> - NRP-R-SYSW-FA-0001-03, Rev.03, Exhibit I, Item Number 15j, RFP Reference-Exhibit D-2.10c.2	Submittal Date: May 15, 2007	SRCT No.: 06-00029
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Section I. Submittal Information (includes above information)

Submittal Description and Revision Summary for Entire Submittal:

The document included in this submittal is revised from the previous Rev. 02A submittal in January 2007. The redline changes submitted as Rev. 02A of this document have been accepted by BSC. The new changes shown in the PDF file containing the Rev. 03 redlines resulted from the comment resolution process for the Rev. 02A submittal.

In addition, the Rev. 02A cask maintenance facility (CMF) text was reviewed and revised by BSC. The current Rev. 03 CMF discussion includes the revised text provided by BSC.

The Facilities-Design Analysis Report, Caliente Rail Corridor is a DEIS-related report of the facilities at the concept design level. The report Includes descriptions and drawings of the facilities based on BSC-provided data and other reports produced by NRP. The information herein is intended to convey general configuration of the facilities, which will be further refined during final design.

Special Instructions:

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Section II. Data File Information (Add lines below if needed for additional files. Indicate "Last item" or "End of list" on last line used.)

Filename	Rev.	File Size	Description (File description and revision summary for file)	Application and Version/ Add-in or Extension and Version
T10_Cover ⁶⁻⁵⁻¹⁰⁻⁰⁷ 2007.ppt	03	701 KB	Report cover for <i>Facilities-Design Analysis Report, Caliente Rail Corridor</i> - NRP-R-SYSW-FA-0001-03, Rev. 03	Microsoft Powerpoint 2003
T10_CRC_Facilities_FINAL_Rev03_15May07.doc	03	25,142,144 KB ⁶⁻⁵⁻¹⁰⁻⁰⁷	Main text with all graphics - <i>Facilities-Design Analysis Report, Caliente Rail Corridor</i> - NRP-R-SYSW-FA-0001-03, Rev.03	Microsoft Word 2003
T10_CRC_Facilities_FINAL_Rev03_15May07.pdf	03	3,843 KB	Scanned final version of the complete document with all imbedded graphics - <i>Facilities-Design Analysis Report, Caliente Rail Corridor</i> - NRP-R-SYSW-FA-0001-03, Rev.03	Adobe Acrobat 7.0 Standard Version
T10_CRC_Facilities_FINALReadonly_Rev03_15May07.doc	03	25,142,145 KB ⁶⁻⁵⁻¹⁰⁻⁰⁷	Main text (Read Only) with all graphics - <i>Facilities-Design Analysis Report, Caliente Rail Corridor</i> - NRP-R-SYSW-FA-0001-03, Rev.03	Microsoft Word 2003
T10_CRC_Facilities_FINALredlines_Rev03_15May07.pdf	03	3,314 KB ⁸⁻⁰⁵⁻¹¹⁻⁰⁷	Scanned redline version of the complete document with all imbedded graphics - <i>Facilities-Design Analysis Report, Caliente Rail Corridor</i> - NRP-R-SYSW-FA-0001-03, Rev.03	Adobe Acrobat 7.0 Standard Version
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Subcontractor: Nevada Rail Partners	Item Number/Title/Revision: T10/Facilities - Facilities-Design Analysis Report, Caliente Rail Corridor - NRP-R-SYSW-FA-0001-03, Rev.03, Exhibit I, Item Number 15j, RFP Reference-Exhibit D-2.10c.2	Submittal Date: May 15, 2007	SRCT No.:
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5/10/07



Facilities Design Analysis Report Caliente Rail Corridor

Task 10: Facilities

Rev. 03

Document No. NRP-R-SYSW-FA-0001-03

prepared by:



prepared for:



Nevada Rail Line Conceptual Design

Subcontract NN-HC4-00239

May 15, 2007

Facilities–Design Analysis Report Caliente Rail Corridor

Task 10: Facilities

Rev. 03

Document No. NRP-R-SYSW-FA-0001-03

Nevada Rail Line Conceptual Design

Subcontract NN-HC4-00239

15 May 2007

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List of Acronyms

ADA	Americans with Disabilities Act
AR	Air Force Road
ATM	Assistant Trainmaster
cfs	Cubic Feet Per Second
CMF	Cask Maintenance Facility
CRC	Caliente Rail Corridor
Caliente	Town of Caliente
DEIS	Draft Environmental Impact Statement
DOE	U.S. Department of Energy
EOL	End-of-Line
F	Fahrenheit
FRA	Federal Railroad Administration
gpd	Gallons Per Day
GROA	Geologic Repository Operations Area
HLW	High-level Radioactive Waste
ICBO	International Conference of Building Officials
MOW	Maintenance-of-Way
NRL	Nevada Rail Line
NTOC	National Transportation Operations Center
NTTR	Nevada Test and Training Range
RA EIS	Rail Alignment Environmental Impact Study
RCRA	Resource Conservation and Recovery Act
RIP	Repair-in-Place
SNF	Spent Nuclear Fuel
sq ft	Square Feet

List of Tables Figures and Acronyms

TCC	Train Control Center
UBC	Uniform Building Code
UPRR	Union Pacific Railroad

1.0 Executive Summary

The purpose of this *Facilities-Design Analysis Report, Caliente Rail Corridor* is to:

- Provide documentation and support for conceptual layouts of facilities sites including yards, buildings, parking and access, and supporting infrastructure
- Provide a basis for continuing design development of the Caliente Rail Corridor (CRC) facilities
- Provide technical data for the U.S. Department of Energy (DOE) Rail Alignment Environmental Impact Statement (RA EIS)
- Document interface points between Nevada Department of Transportation, National Transportation Operations, and repository site development engineering personnel. This includes functional, spatial, access, operational, utility interface points

The term "Rail Facilities", as used in the report, includes trackage, buildings, utilities, access roadway, and other site improvements required for the purpose of supporting line haul train operations and rail line maintenance. While the main line of the CRC, including passing sidings and the signaling system infrastructure can also be termed rail facilities, these items are not addressed in this report but are the specific subjects of the other reports.¹

1.1 FACILITIES REQUIRED

The CRC would require various operational and maintenance facilities to operate and provide for ongoing maintenance for the track structure and the DOE owned rolling stock, buildings, and utilities during the operational life of the facility. These facilities include the following (see Figure 2-A):

- The Union Pacific Railroad (UPRR) interchange facility sited adjacent to the UPRR mainline tracks. The two alternate locations include Caliente and Eccles.
- CRC staging yard alternates at the Eccles North, Caliente Indian Cove, and Caliente Upland, sited adjacent to the main track and near the UPRR interchange facility. This site will incorporate a satellite maintenance-of-way (MOW) facility.
- The CRC end-of-line (EOL) facility sited adjacent to the main track and near the Geologic Repository Operations Area (GROA) and considered with the cask maintenance facility (CMF) co-located. This site would incorporate a satellite MOW facility.
- The MOW headquarters facility location has been identified approximately five miles south of Tonopah, in Esmeralda County, on the east side of US Highway 95.
- The MOW trackside facility site is to be located in Nye County, approximately 23 miles south from US Highway 6 on Air Force Road (AR) 504; close to the boundary of the Nevada Test and Training Range (NTTR) in the vicinity of Reed's Ranch. The facility is to be located to the west and in close proximity to AR 504. AR 504 is a paved road.

These facilities are in addition to the over 330 miles of main track and passing sidings (as shown in the *Engineered Plan & Profile Drawing Set, Caliente Rail Corridor* [NRP 2006]), bridges and culverts, grade crossings, railroad signals and communications systems, and wayside equipment associated with the CRC alignment, and any temporary facilities associated with the construction of the rail line.

¹ Certain aspects of the facilities described in this report would be applicable in a similar manner to any given alignment. Therefore, the term Nevada Rail Line (NRL) is used to describe aspects of facility design, construction, and operation that are not particular to a specific alignment, and the term CRC is used only where specifically applicable to the Caliente Rail Corridor.

1.0 Executive Summary

All of the CRC facilities have concepts based on conventional freight rail operations. There are no unique components, infrastructure, or systems to accommodate the practices associated with nuclear materials handling, storage, or operations. In addition, no specific security components, infrastructure or systems are included in the current concepts.

1.2 UNION PACIFIC INTERCHANGE FACILITY

Interchange of traffic between railroads is normally accomplished by means of tracks dedicated to the exchange of rail cars. Pre-notification of all train movements to and from the UPRR would be required. Incoming freight cars would be set out on the interchange track by UPRR crews. The UPRR crews would also pick up any out-going cars at the interchange yard. CRC crews would set out, out-going cars and pick up incoming cars on the interchange tracks. Incoming and out-going cask cars would be interchanged at the CRC staging yard directly. Additional operations information is contained in the *Operations and Maintenance Report, Caliente Rail Corridor* (NRP 2007b) for the interchange function.

1.3 CALIENTE RAIL CORRIDOR STAGING YARD

The CRC staging yard is where railroad cars would be held and sorted into trains for delivery to the EOL (inbound) or interchange tracks (outbound). Also, loaded and empty cask cars would be interchanged at this facility. Loaded cask trains would be processed intact and expedited through the interchange administrative process for movement to the EOL. Interchange documentation and car/train inspection functions would be accomplished in the staging yard.

Facilities at the staging yard include a locomotive fuel and sanding area, maintenance warehouse, light repair shop area, MOW lay down area, and a yard office. This facility is also a potential location for the National Transportation Operations Center (NTOC) and the CRC train control center (TCC).

The staging yard would be one of the first major facilities constructed on the project. As such, the yard would serve as staging for the balance of railroad construction handling ballast, rail, tie, and other materials.

A total of three potential locations for the staging yard have been identified. Two for the Caliente alignment alternate: Caliente Indian Cove and Caliente Upland; and one for the Eccles alignment alternate: Eccles North. Of the three, only one would be constructed.

1.4 END-OF-LINE YARD

NRL trains carrying casks loaded with spent nuclear fuel (SNF) and high-level radioactive waste (HLW), and general freight in support of GROA construction and ongoing support will travel from the staging yard to the EOL facility. The EOL is located approximately one mile south of the cask receipt security station located within the GROA.

The purpose of the EOL facilities is to provide for the following:

- Termination for the main track movement of cask trains
- Rearrangement of train consists and for the delivery of loaded cask cars to the repository receiving inspection area
- Holding buffer cars
- Receipt (from the repository) and temporary storage of empty cask cars, and bad order rail cars requiring repair

1.0 Executive Summary

- Assembly of outgoing trains destined to the CRC staging yard
- Shuttling of empty cask cars, buffer cars, to the CMF
- Receipt and delivery to the repository of waste packages, construction materials, and fuel oil
- A potential base for the CRC train control center
- A building to support CRC operations and maintenance, including the servicing, inspection, and maintenance of diesel locomotives
- A base to support escort cars and personnel associated with incoming (and possibility outgoing) cask train movements
- Potential location NTOC
- Location for rail car and locomotive light repair facility

1.5 MAINTENANCE-OF-WAY FACILITIES

Headquarters Facility – Maintenance of the track, bridges, tunnels, culverts, grade crossings, signal equipment, communications equipment, and other wayside facilities and equipment would be coordinated from the MOW headquarters. In addition, the staff at the MOW headquarters building would be responsible for responding to rail related accidents, derailments where the track conditions may have been compromised, and to assist in the coordination of activities which may require recovery of locomotives, rail cars, casks and other equipment that have been derailed from the track. Shop and storage space will be provided to accommodate staging of supplies/equipment and light repair for NRL vehicles.

Trackside Facility – The MOW trackside facility includes a building for administrative purposes, inside storage of spare parts and small tools, and MOW shop area; and outside storage area for heavy materials (ties, rail, ballast, etc.), and storage of large on-track track maintenance machines. The MOW trackside facility has access to the CRC mainline for the handling of rail cars carrying heavy and bulk materials, and movement of on-track maintenance machines.

Satellite Facility – Additionally, there are MOW satellite facilities located at the EOL yard and the CRC staging yard. These satellite facilities function in a manner similar to the MOW trackside facility but on a smaller scale. The satellite MOW areas are described in the discussion of the facility with which they are associated.

1.6 CASK MAINTENANCE FACILITY STATUS UPDATE

Description of Possible CMF Functions – The specific design elements and overall implementation of the CMF is outside the scope of NRL conceptual design. However, the ongoing conceptual design of the EOL facility has been coordinated with known information regarding the CMF. The EOL facility design allows for a 20-acre site of buildings and yards for a CMF with four tracks connecting to the EOL yard. The CMF would process the transportation casks, keeping them road ready and containing the correct internal equipment, including the associated transportation skids, impact limiters, lifting equipment, special tools, spare parts, and instrumentation.

2.1 INTRODUCTION

This report is one of several prepared to support and provide initial input to the first draft of the RA EIS. Each report covers a specific topic for a specific purpose. Accordingly, each report utilizes data from various sources in varying levels of detail and precision as appropriate, as well as in different contexts. While the reports are consistent in overall conceptual design, it is possible that numerical values for certain parameters may vary between the reports. This is the result of the conceptual nature of the reports and their distinct areas of focus – it should not be considered an abnormal situation or an indication of error.

This *Facilities–Design Analysis Report, Caliente Rail Corridor* presents a description of the location, site, functions, concept configuration and GROA site parameters for the various facilities of the CRC, issued for Draft Environmental Impact Statement (DEIS) reference.

The facilities and their locations included within this document are:

- UPRR Interchange (note: only the appropriate alternate would be constructed)
 - Caliente interchange near UPRR milepost 461.0, within the town of Caliente (Caliente)
 - Eccles interchange near UPRR milepost 466.9
- CRC Staging Yard (note: only the appropriate alternate would be constructed)
 - Eccles North, adjacent to the CRC alignment
 - Caliente Indian Cove, adjacent to the CRC alignment
 - Caliente Upland, adjacent to the CRC alignment
- EOL Yard with CMF potentially co-located, at the end of the CRC alignment
- MOW Facilities (note: all four would be constructed)
 - Headquarters facility, adjacent to US Highway 95,
 - Trackside facility, adjacent to the CRC alignment
 - Satellite facility, within the CRC staging yard
 - Satellite facility, within the EOL yard

Figure 2-A presents the CRC facility locations.

2.2 PURPOSE

The purpose of this *Facilities–Design Analysis Report, Caliente Rail Corridor* is to:

- Provide documentation and support for conceptual layouts of facilities sites including yards, buildings, parking and access, and supporting infrastructure;
- Provide a basis for continuing design development of the facilities;
- Provide technical data for the DOE RA EIS; and
- Document interface points between Nevada Department of Transportation, National Transportation Operations, and repository site development engineering personnel. This includes functional, spatial, access, operational and utility interface points.

Additional details relative to floor plans, building layouts, and facility requirements would be developed during continuation of conceptual design, and subsequent engineering activities.

2.0 Introduction & Purpose

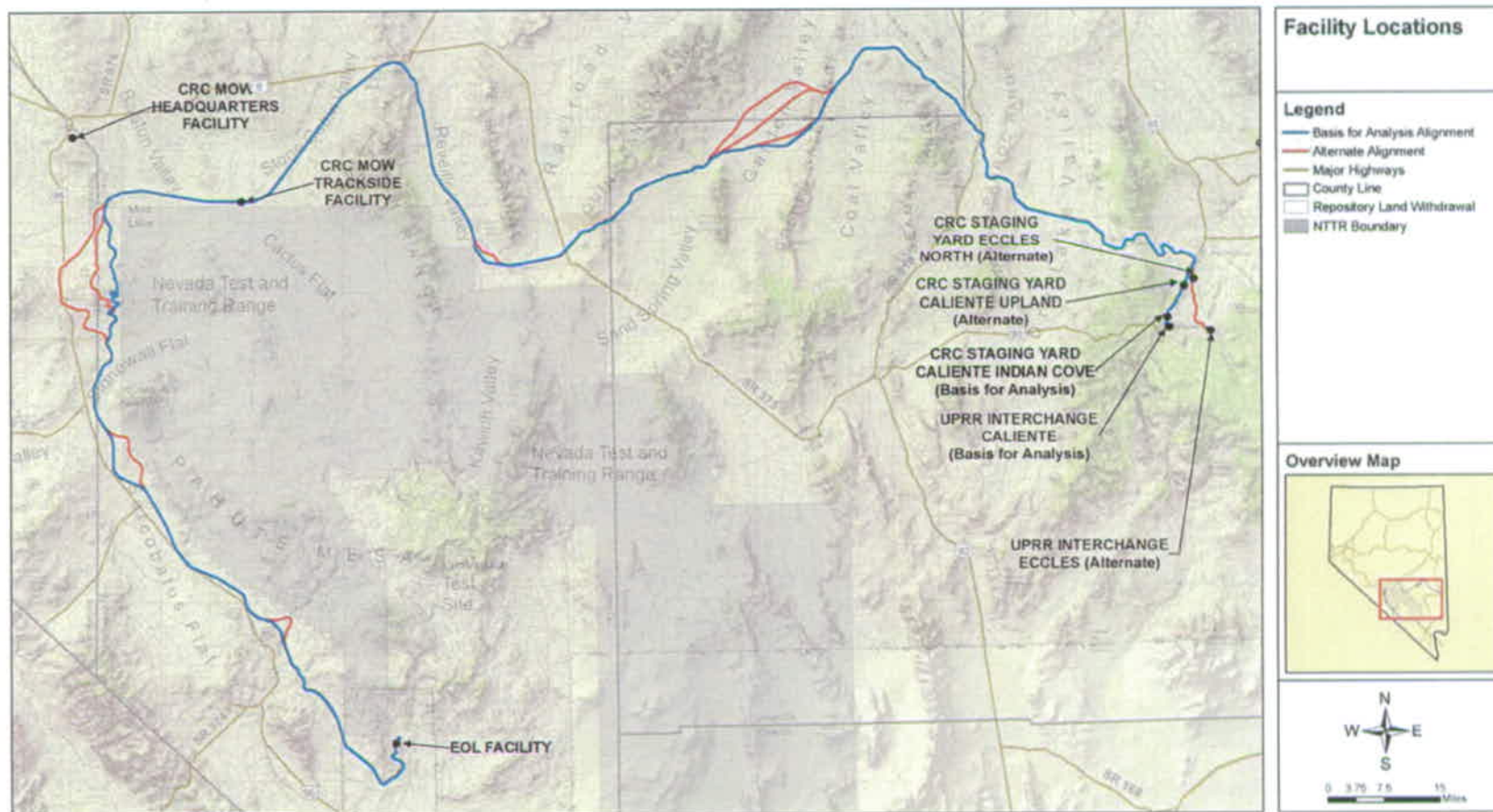


Figure 2-A. CRC Facility Locations²

² Throughout this and other NRP reports, the phrase “basis for analysis” is used to provide a frame of reference for NRP’s evaluations of the alignment’s construction engineering and operational characteristics. Except for the *Operations and Maintenance Report, Caliente Rail Corridor* (NRP 2007b), NRP reports provide data for all alignment segments so that consideration of other alternative alignment segment combinations may be accomplished.

3.1 ANALYSIS METHODOLOGY

3.1.1 Track Layout

The conceptual track configurations developed for the proposed facilities consider the operational and maintenance needs of the finished railroad, as well as those likely to be required to support construction activities. Given the volume of traffic and length of trains likely during construction phases, yards sized on construction considerations would be of more than sufficient capacity for operations. There is no need to build separate construction yards since construction and operations are distinct phases, and there is no benefit to reducing the size of yards later; therefore the more conservative configuration of the larger yards is maintained. This also has the effect of incorporating some additional capacity and redundancy into the facilities.

Track geometry and trackwork design follow conventional Class 1 practices for high quality facilities of these types. Typical equipment (locomotives and cars) operated by Class 1 railroads today can operate into and be accommodated without restriction by the proposed facilities.

3.1.2 Buildings

The methodology and the documentation for determining a conceptual level footprint of each building is based on the following assumptions and programming processes:

- The staffing requirements and location assignments as set forward in the *Operations and Maintenance Report, Caliente Rail Corridor* (NRP 2007b) provide the framework for determining functional space requirements.
- The analysis of functional space requirements is based on industry design standards and current practices at similar rail support facilities.
- Industry standard functional spaces, consistently used for each facility, are incorporated into a space sizing table” (a preliminary space program document) and include the following: Administrative Space (or Administrative/Crew Change), Welfare Space, Shop/Storage Space, and Utility Space. A square foot quantity is assigned to each staffing function or support space and assumptions or calculations shown, as applicable, that provide information to support the assigned square foot amounts.
- Once total space allocations are assigned to each functional space, “blocks” of space indicating the total approximate square feet required for the space are arranged together to form a footprint of how the space might conceptually be laid out. This block diagram is provided as a supplement with each space sizing table, and is shown as the concept configuration footprint.
- For simplicity, space allocations in plan view are shown as rectangular in shape. When these individual areas are pulled together in the design of actual buildings, issues such as column grids, door locations, and egress and other code requirements would cause changes to these concept layouts. For the purpose of these concept layouts, block arrows are shown as an indication of possible entry/egress points that may be required. Also, a grid based on a spacing of 25 feet to 30 feet, to indicate a potential future structural framework for the building, provides a logical starting point for the conceptual functional space arrangement.
- To provide clarity and consistency, colors are assigned to each functional space for both the space sizing table and the concept configuration footprint: Administration (or Administrative/Crew Change) (Green), Welfare Space (Blue), Shop/Storage (Yellow) and Utility (Orange).

3.0 Caliente Rail Corridor Facilities

3.1.3 Staffing / Sizing

As mentioned under the methodology for determining appropriately sized facilities at a concept level, it was necessary to use the staffing projections from the *Operations and Maintenance Report, Caliente Rail Corridor* (NPR 2007). The initial staffing requirements for the core railroad functions of operations and engineering and maintenance are difficult to determine at this time. The need for some departments may depend on the relationship with a larger organization that has not yet been defined. Therefore, staffing for operations and maintenance has been estimated based upon the anticipated amount of work that will need to be done regardless of where the positions are located in an organizational structure. Staffing requirements at each facility are summarized in Table 3-A. The staff positions have been condensed into three categories: professional, labor, and clerical. Approximately 15 TCC/NTOC employees are included in the EOL staffing total; however, CMF staffing is not addressed because CMF needs and functions are assumed to overlap with adjacent facilities. The EOL satellite MOW shop will be intermittently staffed by personnel headquartered at either Tonopah MOW facility.

Table 3-A. Staffing Matrix Summary

Staff Position	Primary Location				Total
	Staging Yard	MOW Headquarters	EOL Facility	MOW Trackside Facility	
Professional	4	4	11	1	20
Labor	46	2	25	37	110
Clerical	0	4	4	2	10
Total	50	10	40	40	140

Individual facility spreadsheets were created by assigning the appropriate square feet for each assumed staffing position or support space, taking into consideration that specific requirements of the office operation performed dictates the size of the working area.

The following assumptions and standards were used to size each space accordingly:

- The unit of measurement in all cases for assignable area is square feet. Within particular groups or clusters of spaces, the assignable areas are rounded to the nearest 5 sq ft. Total sq ft for the facility are typically rounded to the nearest 100 sq ft, as anything more "precise" would be meaningless at the concept space programming level.
- The sq ft number indicated for each staff space or room is the Net Area (primary occupied and functional areas). Typically a space allocation of 20-25 percent of the Net Area is programmed for circulation necessary to access work spaces, rooms, and as a means of egress, such as hallways or corridors from the building. This report uses a circulation factor of 20 percent for Administrative, Welfare and Utility spaces, which is added at the summary area at the end of each functional space. The exception to this added circulation factor is the Shop/Storage space. This area already takes into consideration internal circulation and assumes direct exterior access.
- For all four functional space totals, an additional 25 percent has been added as a contingency to account for additional space requirements not yet identified.
- The space requirements of the Administrative (or Administrative/Crew Change) and Welfare spaces are derived from individual (assumed employee count) space allocations.

3.0 Caliente Rail Corridor Facilities

- Space requirements for Shop/Storage space and Utility rooms (mechanical, electrical, telephone, data, and janitor's rooms) are a function of the equipment that may be required to support the work or building functions.
- Administrative functions are divided into classifications each with an assignment of space that will support the job performed. For example, the managerial staff was assigned an area of 300 sq ft, which could allow for an enclosed office with additional space for a small meeting area. Supervisory staff was assigned 150 sq ft/person, and non-management/supervisory positions were assigned 80-100 sq ft/person, assuming some sharing of space could occur. For train crews and maintenance staff that do not need a dedicated work space in the facility, 35-80 sq ft/person was assigned to perform office related functions at a shared counter. An assumption was made as to the maximum number of staff that might be using these shared spaces at the same time and the amount of the space was sized accordingly. Where needed, a detail of the breakdown for staffing and sq ft allotments, are noted under "Methodology / Assumptions".
- Welfare spaces include lunch/break room, conference room, locker/shower rooms, and restrooms. The lunch/break room size was defined by the number of staff that might need to use the room during peak hours. A space allocation of 30 sq ft/person is typical for these areas. If a conference room was assumed to be required, it was also based on the maximum number of staff that typically would use the space; 20 sq ft/person was used for this calculation. Locker rooms assumed that 6 sq ft/person would accommodate space for full height lockers, and showers were assumed for all locations. An assumption that of staff needing lockers (those without a permanent office or workstation within a given facility), 75 percent would be male and 25 percent female. This also affected the count of the showers in some of the larger facilities. To size the restrooms, fixture counts determined the size of these spaces; they are based on building "occupants" in accordance with state and local codes, not actual building occupants. Again, assumptions and calculations for all these spaces are shown under "Methodology / Assumptions".
- Lodging functions would be provided at the EOL yard/administrative office and crew change facility. It is assumed that an estimated four crews may require eight total "hotel" rooms, complete with private toilet/shower rooms at approximately 390 sq ft per room.
- Shop and associated storage area sizes were determined by an engineering analysis on a sq ft per person allotment based on knowledge of these types of spaces at similar rail support facilities. Specific sizes of equipment and quantity/sizes of materials would need to be determined as conceptual design progresses in order to confirm the actual space need requirements.

3.1.4 Location

Locations of the facilities were chosen in conformance with their operational function. Typically, the facility is adjacent to the alignment, depending on the nature of the facility. The exception is the MOW headquarters facility, which is not adjacent to the alignment. A secondary consideration is vehicle access to the facility. All facilities are sited so as to have good vehicle access. This required the addition of an access road in some cases.

3.1.5 Utilities

Facilities would require the typical power, water, propane or natural gas, water treatment and sewage systems. A description of utilities is included in the sections for each facility. The water requirements during construction for compaction, dust control, and other miscellaneous purposes for each of the facilities described in this report are presented below in Table 3-B. Daily water requirements for CRC operations are also included in Table 3-B. In addition to commercial sources, electric power could be supplied from power distribution system, if installed. In addition, facilities would require the capability of

3.0 Caliente Rail Corridor Facilities

interfacing with the communications system. Capability of communicating with the TCC and other facilities via fiber-optic cable and/or radio would be incorporated.

Table 3-B. Estimated Water Requirements for Facilities

Facility	Required During Construction		Required During Operation		
	Gallons Required (Total)	Acre Feet Required (Total)	Daily Demand (gallons)	Total Annual Demand (acre feet)	Emergency Storage for Fire Safety (gallons)
UPRR Interchange - Caliente	1,500,000	4.60	0	0	0
UPRR Interchange - Eccles	5,625,000	17.30	0	0	0
Staging Yard – Caliente Indian Cove	12,375,000	38.00	5,500	6.20	110,000
Staging Yard – Caliente Upland	5,625,000	17.30	5,500	6.20	110,000
Staging Yard – Eccles North	5,625,000	17.30	5,500	6.20	110,000
EOL Facility	52,500,000	161.10	6,000	6.70	220,000
MOW Trackside Facility	3,750,000	11.50	2,500	2.80	100,000
MOW Headquarters	262,500	0.80	3,000	3.40	120,000
Sidings	-	-	165	0.20	0
Basis for Analysis Total	542,887,500	216.00	17,165	19.20	550,000 (1.70 acre feet)

The construction water requirements are based on earthwork quantities shown in *Comparative Cost Estimates, Caliente Rail Corridor* (NRP 2007a) and an average water use of 90 gallons/cubic yard. The operational water requirements are derived from estimated staffing and shift projections, a 50 gallon/per day per capita use ratio, shop process needs, and a multiplier of 1.5 to account for miscellaneous water needs. To calculate the annual demand, the daily requirement was multiplied by 365 days/year and divided by 325,851 gallons/acre-foot. The emergency storage requirements have not been included as part of the annual demand because these requirements are anticipated to be a one-time demand of approximately 1.69 acre-feet that would only be replenished as needed, not necessarily on an annual basis.

Storm Drainage – Storm water runoff for each facility site would be accomplished by a collection system of onsite inlets and storm drain pipes that would flow to an onsite detention pond. Based on a 50-year operational life, the detention pond would be sized to handle the design rainfall for a 25-year storm and 24-hour duration with an overflow to handle larger storm events. Depending on the soil conditions at the facility site, storm water collected in the detention pond would be released to a natural waterway or creek and/or be removed by percolation into the ground.

Paved areas for parking, roadways, and storage areas would be graded so that no drainage area would reach a depth of one foot of water before being released to another drainage area, or, in the case of a clogged inlet, released offsite of the drainage area. Grading around buildings and other critical facilities (such as electrical transformers, fueling areas and storage tanks) would direct storm water runoff away from these facilities to avoid flooding. All drainage inlets within the paved and trackway areas of each facility would use inlet filters to prevent sedimentation, debris, and oil from passing into the storm drain system.

3.0 Caliente Rail Corridor Facilities

Mainline trackway drainage would be accomplished via positive drainage from the subballast to drainage ditches adjacent to the trackway. Trackway drainage for the yards and interchange facilities would be accomplished by either underdrains incorporated into the subballast or, in the case of a raised trackway, positive drainage from the subballast to surface inlets located between the tracks. The choice of underdrains or surface drainage would be determined by the top-of-rail elevation in relation to existing ground elevation at each facility location.

Sanitary Sewer – Sanitary sewer effluent for each site would come from each building's plumbing fixtures and from treated industrial waste. Required capacity for each site's sanitary sewer is assumed to be equivalent to its capacity for domestic water usage. An oil/water separator unit would be used to treat industrial waste produced by shops and maintenance areas. The separated industrial waste would be drummed and stored for offsite disposal, and the effluent would flow to a sewage storage tank.

Any nearby sanitary sewer facilities having the necessary excess capacity could be utilized by either gravity flow or via a force main. Barring such available facilities, sewage from the storage tank would either be pumped to tanker cars for disposal at an offsite treatment plant or flow through a secondary treatment unit and then to a sanitary leach field (soil conditions permitting) away from water supply wells. As with the industrial waste treatment, waste generated from the secondary sewer treatment would also be drummed and stored for offsite disposal.

Water (Domestic & Fire) – Assuming there is no convenient source for a domestic water service connection, locally drilled wells would supply both domestic and fire water at each facility site. Water from the well system would require onsite treatment and then be pumped to separate storage tanks for domestic and fire uses. Each tank would require a booster pump to obtain the proper operating pressure for its respective use. The booster pumps would be connected to an emergency generator to maintain pressure during a power outage. Fire protection at each facility site is assumed to include fire sprinklers in each building and fire hydrants spaced at 300 feet around building sites and paved areas (such as parking and storage areas). Domestic water usage would be determined by the approximate number of building occupants plus any specific facility uses such as train washing and shop or repair work.

Electrical Power – Based on previously designed sites and facilities of a similar size and nature, a 12 kilovolt electrical service would be required for each facility. Depending on the distance from an available power source(s), larger distribution lines and/or intermediate substations may be needed. In addition to commercial sources, electric power could be supplied from an installed power distribution system. Each facility site would require a 12 kilovolt/480 volt transformer with a 480 volt distribution system to power industrial equipment and feed each building where a 480 volt/120 volt transformer would supply the building power. Additional transformers may be required for other site requirements such as site lighting, power to yard switches and signals, or power for communications equipment. Each site would require a diesel-powered emergency generator to supply electrical power in case of an outage.

It is unknown at the present time what types (and quantities) of equipment will be powered at the various facilities. Normal power demands from similar facilities having comparable functions on other projects were used to provide rough approximations of potential power usage for buildings. The square footage of comparable buildings was used on a directly proportional basis to generate the power estimates. Electrical power demands were only estimated for buildings, not outside lighting or other site features.

Gas – If required, natural gas or propane would be transported to each facility site and stored in onsite storage tanks. Some sites may require the use of natural gas or propane for industrial uses, such as the train washer at the EOL facility. The use of electrical heating units and water heaters may be a more cost effective solution at other sites where gas is only required for heating and hot water. This would eliminate the delivery, storage, and distribution costs for compressed gas at those facilities.

3.0 Caliente Rail Corridor Facilities

Communications – Facilities would need to interface with the NRL communications system. Fiber-optic cable and/or radio could be incorporated to provide the capability of communicating with the TCC and other facilities.

3.1.6 Waste Streams

The proposed rail project will use hazardous materials typically found in industrial projects. Hazardous materials such as paints, aerosols, diesel fuel, gasoline, batteries, adhesives, and solvents will be stored and used during construction and operation. These materials will be stored in accordance with applicable federal and state regulations. A spill prevention and response program will be implemented to minimize environmental impacts in the event of an accidental spill.

The construction and operation of the proposed rail project will generate typical non-hazardous and hazardous wastes. Potential wastes include refuse, rubbish, vegetative debris, concrete, scrap metal, scrap lumber, paint, non-empty/non-working aerosol cans, used oil, used antifreeze, spent batteries, and lamps. These wastes will be characterized as either solid or hazardous waste and managed in accordance with State of Nevada regulations. Where possible, waste such as scrap metal, used oil, used anti-freeze, spent batteries, and lamps will be recycled.

3.2 ARCHITECTURAL CONSIDERATIONS

The CRC will be entirely within the Great Basin Desert. This area is considered to be a cool or "cold desert" due to its northern latitude (35° to 40°), as well as higher elevations. The region is one of the sunniest in the United States, with over 85 percent annual possible sunshine. Precipitation, generally around 7-12 inches annually, is more evenly distributed throughout the year than in other North American deserts. Winter precipitation often falls as snow.

Nevertheless, the climate of this "cold" desert region is one of the most varied and extreme within the United States. On a daily basis the temperature will swing an average of 30°Fahrenheit (F). Summer temperature profiles for Tonopah, NV show a swing of 90°F high to 60°F low, with record highs in the 100° to 105°F range. Winters in Tonopah will have a temperature swing from 40°F high to 15°F low, with record lows in the -10° to -15°F range. Records for Caliente area show a summer temperature swing of 100°F high to 70°F low, with record highs in the 110° to 115°F range. Winters near Caliente would have a temperature swing from 50°F high to 25°F low, with record lows in the 0°F range.

In addition to complying with applicable NRL design criteria requirements, architectural design strategies for this climate would focus on the wide daily temperature spread, and to a lesser degree the high summer temperatures and solar heating effects. Design considerations would include:

- Flatten day-to-night temperature swings by selective surfaces and use thermal mass within the building structure.
- Use light-colored roofs and walls to reflect the sun's heat away from the building.
- Never place skylights or light slots so that they let in summer sun. They are only acceptable if they are totally shaded, such as by hoods or overhangs.
- To the extent possible, provide shade for all exposed walls and windows with canopies, overhangs, or planting.
- Make sure hot air does not get trapped underneath large overhangs. Perforated shading devices need to be self-ventilating.
- Provide shaded outdoor places for comfort outdoors in summer.

3.0 Caliente Rail Corridor Facilities

- Use planting to provide a more comfortable environment. Patios and courtyards can hold the tempering effects of vegetation close to the building. However, any landscaping must be compatible with the limited irrigation resources available.
- Use evaporative coolers instead of air conditioning to provide comfort during much of the overheated period. Provide shade for the evaporative cooler.
- Consider that nearby structures and light-paved surfaces can reflect solar heat. Landscaping can be beneficial in that it can shade and humidify for effective summer cooling, while shielding nearby heat sources.
- Avoid large exposures on the east and west where it is difficult to shade.
- Use massive construction materials in the interior of buildings to dampen the effects of high daytime temperatures through time lag and thermal storage capacity.
- Keep heavy landscaping away from walls to prevent the trapping of heat. Thick vines and bushes can actually hold heat against walls, obstructing nighttime radiation to the outside.
- Insulate frame, thin skin, and masonry construction. Insulation should be installed on the exterior or sun-exposed surface of the wall, and the underside of the roof.

To support operations and maintenance along the alignment, industrial use type buildings to house rail system management, administrative personnel, rail operations, equipment maintenance, and trackside systems support personnel have been conceptually configured. These buildings would be single story, with a 15-25 foot roof height, between 6,000 to 25,000 sq ft, providing office areas, employee welfare spaces, shop spaces, and material storage.

Building materials and construction types for these structures would be selected for durability, due to maintenance and operations of rail and heavy repair equipment. Additionally, the projected rail operation life of 50 years indicates that the type of building construction would use substantial materials having a long lifespan. Due to site construction constraints in remote locations, materials would also assemble easily, with minimal water requirements during construction.

Based on the climate, conceptual design of the buildings would be predominately precast concrete or masonry construction, with light colored, ballasted single-ply roof system. Precast wall panels offer quick construction, relative economical construction cost, and design opportunity for thermal mass to mitigate against wide daily temperature swings within the building.

During preliminary design, alternative construction materials and building types such as pre-engineered metal buildings, or panelized, "dryvit" type, construction could be considered and evaluated for suitability for various building construction. Alternative roof construction investigations could consider vented double-roof systems to provide additional shading and mitigate solar effects on the building. Roof-mounted solar photo-voltaic panels could also be reviewed for applicability and economic impact for the life cycle of the buildings.

4.1 LOCATION, PURPOSE, AND FUNCTION

The interchange with the UPRR would be located along the UPRR Caliente Subdivision at either Caliente or Eccles. The purpose of the facility is to allow the interchange of railcars containing general freight between the UPRR and the CRC. General freight for the GROA (construction materials, fuel oil), would arrive in UPRR freight trains and be placed on the interchange tracks by the UPRR train crew. NRL's switching locomotives would then bring the cars from the interchange tracks to the staging yard for inspection and administrative processing.

Loaded inbound cask trains, and other "unit" type trains would proceed directly to the staging yard passing through or bypassing the interchange tracks. At the staging yard, the UPRR locomotives would be exchanged for NRL locomotives.

Interchange from the CRC to UPRR would be accomplished in the reverse of the above movement descriptions.

Figures 4-A through 4-F represent the UPRR interchange.

4.2 BASIS OF DESIGN

4.2.1 Functional Parameters

- Interchange with UPRR to CRC of loaded and empty railroad general freight cars
- Switching of cars
- Bad order rail car set out
- Allow above operations to occur clear of the UPRR main track
- Accommodate any existing UPRR capacity that is impacted by the CRC

4.2.2 Assumptions

- Access to a "wye" and runaround track for relocation of freight cars and turning of equipment (this wye would be located at the UPRR interchange facility at Caliente; however, the existing topography along the Eccles alternate precludes a wye track, so it is located at the Eccles North staging yard)
- Interchange tracks must be adjacent to UPRR mainline
- Must have a minimum of three tracks at least 2,500 feet long
- Must have a lead track at least 5,000 feet long
- Connections to UPRR main track or sidings to have power operated turnouts under UPRR dispatcher control

4.3 TRACK LAYOUT

The interchange tracks are a network of three tracks consisting of an interchange lead track and two interchange tracks. The lead tracks enable a UPRR train to set out or pick up cars without occupying the UPRR mainline and potentially delaying other UPRR trains. Although the functions of the two remaining tracks are flexible depending on specific need at the time, generally one track will be for set out, the other track for pick up. At Caliente, an additional track to accommodate existing UPRR capacity would also be included.

4.4 BUILDINGS

4.4.1 Buildings and Functions

No buildings are required at the interchange tracks. Any communications requirements would be incorporated into the design of the systems supporting the interchange lead track.

4.4.2 Space Sizing Tables / Concept Configuration Footprints

The UPRR interchange yard has no assigned staff, so no space sizing tables or concept configuration footprints are provided. Train crew and other staff such as car inspectors will travel to the yard site as needed.

4.5 SITE LOCATION

Two alternate locations are proposed for the UPRR interchange. One site is at Caliente (UPRR MP 461.0) and the other is on the Eccles segment (UPRR MP 466.9). The Caliente segment interchange tracks would be located in the general area of the former UPRR yards. The Eccles interchange site is located approximately 5.9 UPRR railroad miles east of Caliente. Both sites have existing sidings that would be incorporated into the final configuration. Both locations incorporate existing prevailing track gradients of 0.6 to 1.0 percent, descending to the west.

Caliente Interchange – The interchange tracks would be located near the former UPRR Caliente station and adjacent to the existing UPRR mainline within the corporate limits of Caliente. The site is tangent, flat, open, and not occupied by any structures. Historically, additional tracks were located at this site, although these features have since been removed.

Eccles Interchange – The interchange tracks would be located immediately adjacent to the UPRR mainline within the confines of Clover Creek Wash. The site location incorporates horizontal curves in the existing track alignment. Site preparation includes grading and filling to match the UPRR mainline elevation. The site is adjacent to the Clover Creek Wash area and would incorporate appropriate measures to provide the required embankment and maintain stream bed characteristics. This would include dikes and riprap to properly direct water and maintain track embankment and stream bed integrity. It should be noted that UPRR has done significant work in this area following recent washout conditions.

4.6 UTILITIES

The interchange tracks do not require utilities, except for storm drainage. The interchange site consists of approximately 12 acres, which would produce a runoff rate of 0.38 cubic feet per second (cfs). Assuming a 6-foot deep detention pond, 0.12 acre would be needed. Since this area is so minor, it may be preferable to use a direct discharge to a local creek or stream or a prefabricated drainage basin.

Switches on the interchange tracks would be hand thrown. Power switches on the UPRR mainline serving the interchange lead track would be owned and maintained by UPRR. Power required for power operated switches, signal, and communication are supplied as an integral part of those systems. No additional utilities are required.

4.7 ACCESS AND ROADS

Existing paved roads at the Caliente interchange site, and the unpaved access roads (along the alignment from the Eccles North staging yard) to the Eccles interchange site provide sufficient access for the

4.0 UPRR Interchange

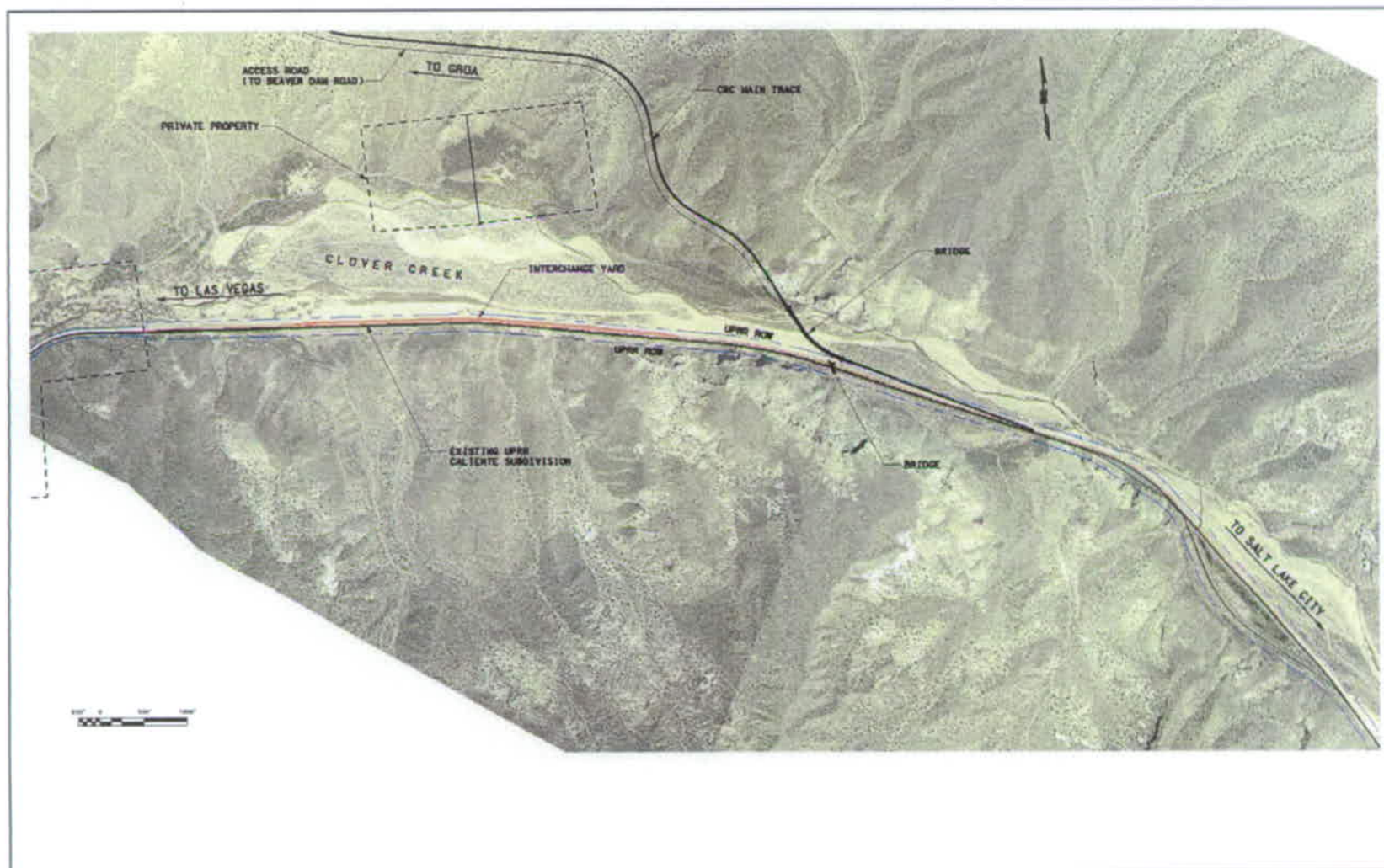
interchange facilities. Other than occasional access by vehicle for car inspectors or track maintenance forces, most activity will take place by the train crews who would be on-board the trains in the area.

4.8 EXISTING FACILITIES

Other than the existing UPRR main track, sidings, and signal installations, there are no existing facilities at either the Caliente or Eccles interchange sites.

4.9 DRAWINGS

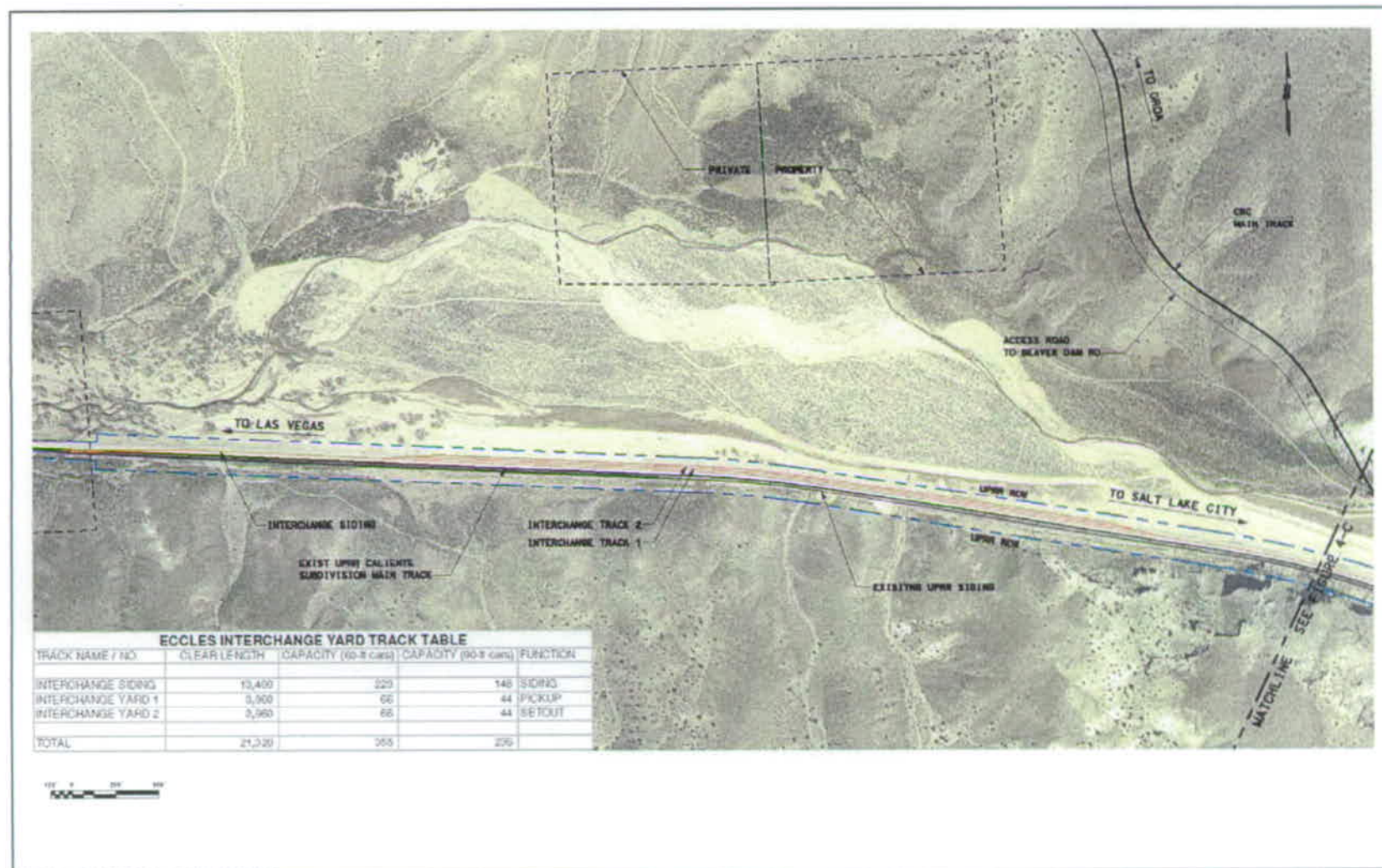
- Figure 4-A - Eccles Interchange Overall Site Plan
- Figure 4-B - Eccles UPRR Interchange 1 of 2
- Figure 4-C - Eccles UPRR Interchange 2 of 2
- Figure 4-D - Caliente Interchange Overall Site Plan
- Figure 4-E - Caliente UPRR Interchange 1 of 2
- Figure 4-F - Caliente UPRR Interchange 2 of 2



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Figure 4-A. Eccles Interchange Overall Site Plan

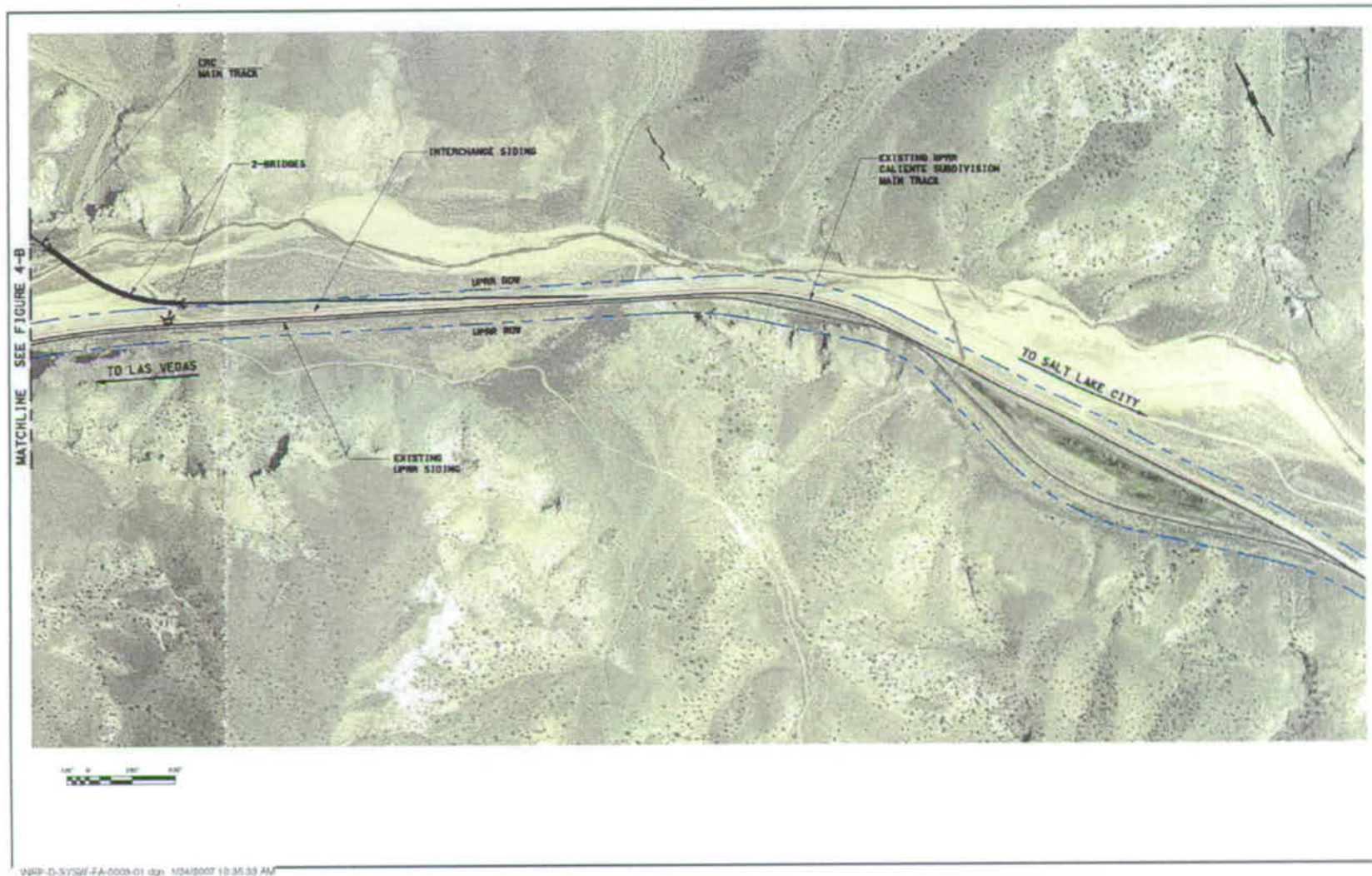
4.0 UPRR Interchange



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Figure 4-B. Eccles UPRR Interchange 1 of 2

4.0 UPRR Interchange



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Figure 4-C. Eccles UPRR Interchange 2 of 2

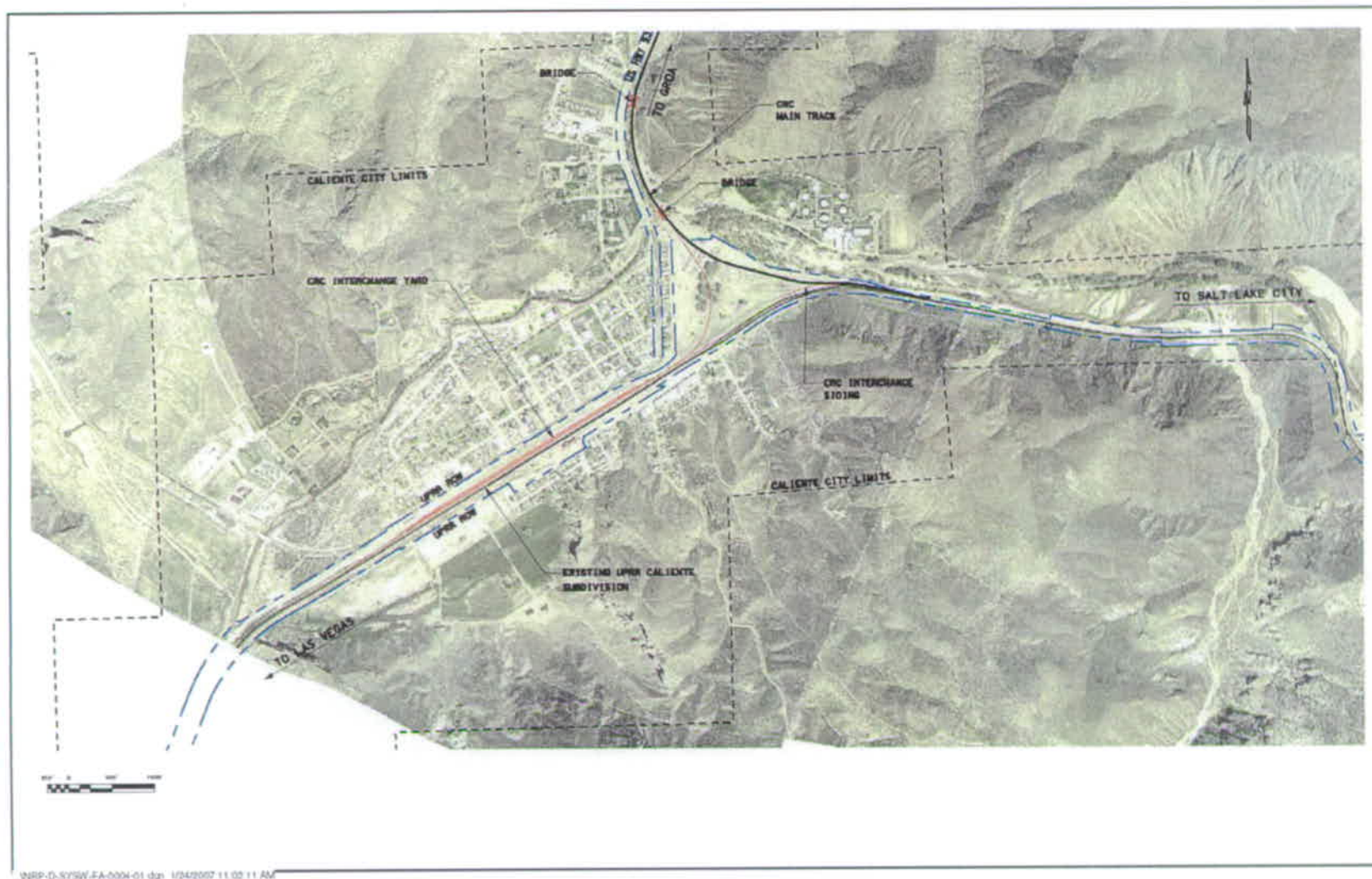
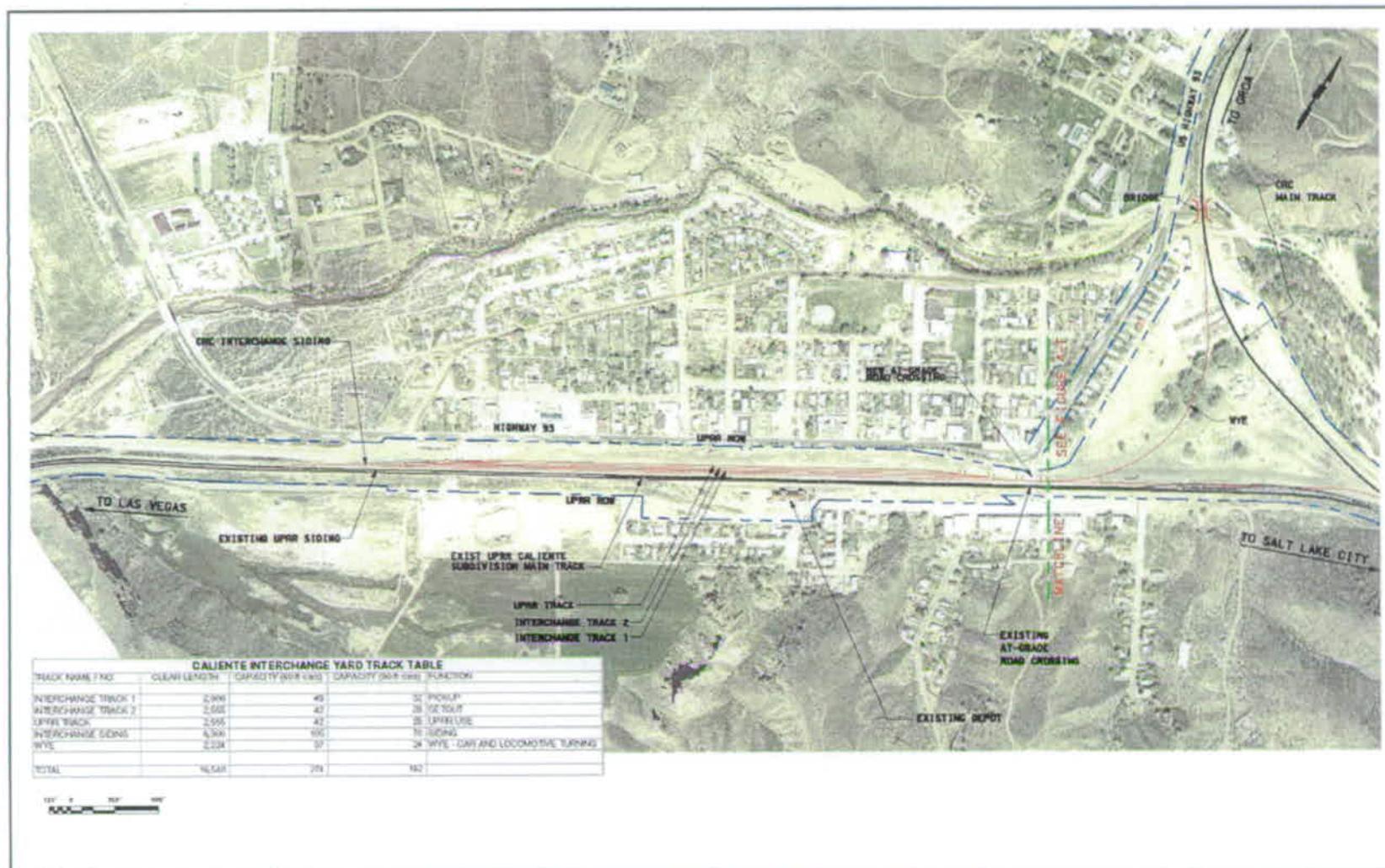


Figure 4-D. Caliente Interchange Overall Site Plan

4.0 UPRR Interchange



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Figure 4-E. Caliente UPRR Interchange 1 of 2



Figure 4-F. Caliente UPRR Interchange 2 of 2

5.0 Caliente Rail Corridor Staging Yard

5.1 LOCATION, PURPOSE, AND FUNCTION

The staging yard is where railroad cars would be held and sorted into trains for delivery to the EOL (inbound) or interchange tracks (outbound). Also, loaded cask trains would exchange UPRR locomotives for NRL locomotives here. Loaded cask trains would be processed intact and expedited through the interchange administrative process for movement to the EOL. Interchange documentation and car/train inspection functions would be accomplished in the staging yard. Facilities at the staging yard include a locomotive fuel and sanding area, maintenance warehouse, light repair shop area, MOW lay down area, and an office for yard administrative and train crew reporting function with the potential for co-locating TCC and NTOC at this facility.

The staging yard will be one of the first major facilities constructed on the project. As such, the yard will serve as staging for the balance of railroad construction handling ballast, rail, tie, and materials cars/trains.

A total of three potential locations for the staging yard have been identified. Two for the Caliente alignment alternate: Caliente Indian Cove and Caliente Upland) and one for the Eccles alignment alternate Eccles North. Of the three, only one would be constructed.

5.2 BASIS OF DESIGN

5.2.1 Functional Parameters

- Interchange with UPRR to CRC of loaded and unloaded cask rail cars and other unit type trains
- Locomotive staging
- Locomotive turning and runaround capabilities
- Rail car to truck off loading of repository destined construction materials and other freight
- Bad order rail car set out and light repair
- Federal Railroad Administration (FRA) safety test/inspections performed prior to train departure
- Locomotive fueling (by fuel truck) and service area with track pans
- Crew check in and crew change
- Parking for employee's vehicles
- Satellite MOW facility
- Facilities for the initial construction of the rail line

5.2.2 Assumptions

- Access provided to UPRR track for "wye" or runaround track for relocation of locomotives to opposite end of train
- Locomotive fueling performed by an off-site contractor with tank truck to service the yard switcher locomotive only. Road locomotive refueling to be handled at the EOL facility
- Portion of staging yard would be required for early construction to support construction of the rail line
- Track and buildings configuration are common to the three locations under consideration

5.0 Caliente Rail Corridor Staging Yard

- Potential location for the NTOC
- Potential location for the TCC
- CMF may be co-located with the EOL facility and would not need to be accommodated here

5.3 TRACK LAYOUT

The basic configuration of the staging yard consists of 12 tracks that include a lead track, an inbound track, an outbound track, six switching tracks, a storage track, a repair-in-place (RIP) track, and a locomotive track. A 25-foot spacing between yard tracks is planned to allow an access road for car and train inspection. The staging yard would be double ended permitting switching from either end.

The Caliente Upland and the Eccles North staging yards also incorporate a wye for additional operational flexibility. At the Caliente Indian Cove site this wye is not included, as the wye at the Caliente interchange yard is sufficiently close.

Although all the yard tracks have been given functional titles, the switching, inbound, and outbound tracks are functionally interchangeable. Actual use of these tracks would be decided by the yardmaster based on current conditions. The RIP track is where light running repairs (i.e. brake-shoe change out, wheel change out, door repair, etc.) would take place for rail cars. The locomotive track is where NRL and, if applicable, UPRR locomotives would be held between road haul assignments. The assigned switching locomotives for the staging yard would also be fueled and sanded on the locomotive track. Fuel will be supplied by a contractor operated truck. Sand and other supplies would also be furnished by truck.

5.4 BUILDINGS

5.4.1 Buildings and Functions

Yard Office – This facility provides space for train and switching crews reporting, operating supervision (trainmaster, yard master), shop mechanic, and administration for processing interchange documentation. The TCC and NTOC functions may be located at this facility (or at the EOL facility) and staffing needs would be accommodated within this yard office building. The approximate dimensions of the staging yard office are 60 feet wide by 110 feet long; occupying approximately 6,615 sq ft.

Satellite MOW Building – This facility provides space for the personnel responsible to maintain the eastern third of the CRC route. This includes space for track inspectors and maintainers, signal maintainers, and supervisory and administrative personnel. In addition, the building provides space for storage of supplies, spare parts, tools, and small track maintenance machinery. The approximate dimensions of the building are 50 feet wide by 120 feet long; occupying approximately 6,000 sq ft.

5.4.2 Space Sizing Tables / Concept Configuration Footprints

An individual facility spreadsheet, “space sizing table”, was created by assigning an appropriate sq ft allocation for each assumed staffing position. The square feet assignments were included under four functional space categories – Administrative (or Administrative/Crew Change), Welfare, Shop/Storage, or Utility. (Refer to 3.1.3 Staffing / Sizing, for further explanation of the methodology and processes for determining square feet allocations.)

Once a sq ft total was determined for each functional category shown in the space sizing table, “blocks” of space indicating the total approximate square feet required were arranged together to form a footprint of how the space might be conceptually laid out. The block diagram is provided as a supplement with each space sizing table and is shown as the “concept configuration footprint”. (Refer to 3.1.2 Buildings,

5.0 Caliente Rail Corridor Staging Yard

for further explanation of the methodology and processes for creating the space sizing table and concept configuration footprint.)

Each area on the concept configuration footprint is assigned a color which correlates with the respective functional space category shown on the space sizing table – Administration (or Administrative/Crew Change) (Green), Welfare Space (Blue), Shop/Storage (Yellow) and Utility (Orange). For simplicity, areas in plan view are shown as rectangular in shape. For the purpose of this layout, block arrows are shown as an indication of possible entry/egress points that may be required. Also, a grid based on a spacing of 25 feet to 30 feet to indicate a potential future structural framework for the building, provides a logical starting point for the conceptual arrangement.

See the following space sizing tables and concept configuration footprints for the facilities located at the staging yard:

- Table 5-A. CRC Staging Yard/Office Yard and Crew Change Facility (Potential TCC and NTOC Location) – Space Sizing Table
- Figure 5-A. CRC Staging Yard/Office Yard and Crew Change Facility (Potential TCC and NTOC Location) – Concept Configuration Footprint
- Table 5-B. CRC Staging Yard/Satellite MOW Building – Space Sizing Table
- Figure 5-B. CRC Staging Yard/Satellite MOW Building – Concept Configuration Footprint

5.0 Caliente Rail Corridor Staging Yard

Table 5-A. CRC Staging Yard/Office Yard and Crew Change Facility (Potential TCC and NTOC Location)–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE / CREW CHANGE SPACE	General Manager (TCC)	300	
	Director of Operations or Director of Transportation (TCC)	300	
	Movement Director / Chief Dispatcher (TCC)	150	
	Chief Crew Dispatcher (TCC)	125	
	Assistant Movement Director (TCC)	125	
	Train Dispatchers (TCC)	300	(5) Dispatchers share 3-shifts 7 days/week. Assume that no more than (3) will be present at one time. Central work area with 100 sq ft per person.
	Crew Dispatchers (TCC)	300	(5) Dispatchers share 3-shifts 7 days/week. Assume that no more than (3) will be present at one time. Central work area with 100 sq ft per person.
	Trainmaster - East	150	
	ATM / Road Foreman of Engines	200	Two (2) ATMs to share workspace. Assumes each has a shift and there is some overlap.
	Yardmaster / Station Agent	100	
	Conductors	150	Check-in / check-out shared workspace for all conductors. Assumes no more than three (3) are present at one time in the yard office. Assume 50 sq ft per person.
	Engineers	150	Check-in / check-out shared workspace for all engineers. Assumes no more than three (3) are present at one time in the yard office. Assume 50 sq ft per person.
	Reception Area	100	
	Administrative Storage, Filing and Supplies	100	
	Circulation at 20 percent	500	
	Contingency at 25 percent	765	Can accommodate required space for security personnel or additional administrative personnel that may need to be added
	Potential NTOC Location	1,000	
	Total Net sq ft for Area	4,815	<i>Approximately 2,375 sq ft is associated with the potential TCC operation</i>
WELFARE SPACE	Men's Locker	170	Full height lockers; assumes 75 percent staff (conductors, engineers and dispatchers - each get a dedicated locker) are male of (36) total lockers required = (27) lockers; round up to (28) @ 6 sq ft per person = 168 sq ft
	Men's Shower	65	Assumes (2) showers total ~ 40 sq ft for Americans with Disabilities Act (ADA)-compliant shower and

5.0 Caliente Rail Corridor Staging Yard

Table 5-A. CRC Staging Yard/Office Yard and Crew Change Facility (Potential TCC and NTOC Location)–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
			25 sq ft for typical shower; assumes 75 percent male staff.
	Men's Restroom	115	Based on occupant load of building not actual occupants. Using <i>Uniform Building Code</i> (UBC) (International Conference of Building Officials [ICBO] 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 6,615 sq ft divided by 200) = (33) occupants with a 50/50 split Men/Women (17 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (1) standard toilet at 25 sq ft, (1) urinal at 15 sq ft, and (1) lavatory at 15 sq ft. Assume that (1) additional urinal at 15 sq ft would be desired assuming that male staff is 75 percent while female staff is 25 percent. (Circulation is included in group total below)
	Women's Locker	65	Full height lockers; assumes 25 percent staff (conductors and engineers - each get a dedicated locker) are female of (36) total lockers required = (9) lockers 6 sq ft per person; round up to (10) at 6 sq ft per person = 65 sq ft
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA shower; assumes 25 percent female staff.
	Women's Restroom	110	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 6,615 sq ft divided by 200) = (33) occupants with a 50/50 split Men/Women (17 Women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, and (2) standard toilets at 25 sq ft each, and (1) lavatory at 15 sq ft. (Circulation is included in group total below)
	Lunchroom/Breakroom	600	Based on (20) total staff at any one time at 30 sq ft person = 600 sq ft
	Circulation at 20 percent	145	
	Contingency at 25 percent	220	
	Total Net sq ft for Area	1,530	<i>Approximately 440 sq ft is associated with the potential TCC and NTOC operations</i>
SHOP / STORAGE	Contingency at 25 percent		
	Total Net sq ft for Area	0	
UTILITY	Electrical, Mechanical, Utility, Telephone/Data Room	180	
	Circulation at 20 percent	35	
	Contingency at 25 percent	55	
	Total Net sq ft for Area	270	

5.0 Caliente Rail Corridor Staging Yard

Table 5-A. CRC Staging Yard/Office Yard and Crew Change Facility (Potential TCC and NTOC Location)–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
	Total Gross Square Feet	6,615	<i>Note: Personnel identified as TCC and NTOC will either be located in this facility or at the EOL yard / administrative office and crew change facility, not both facilities</i>

5.0 Caliente Rail Corridor Staging Yard

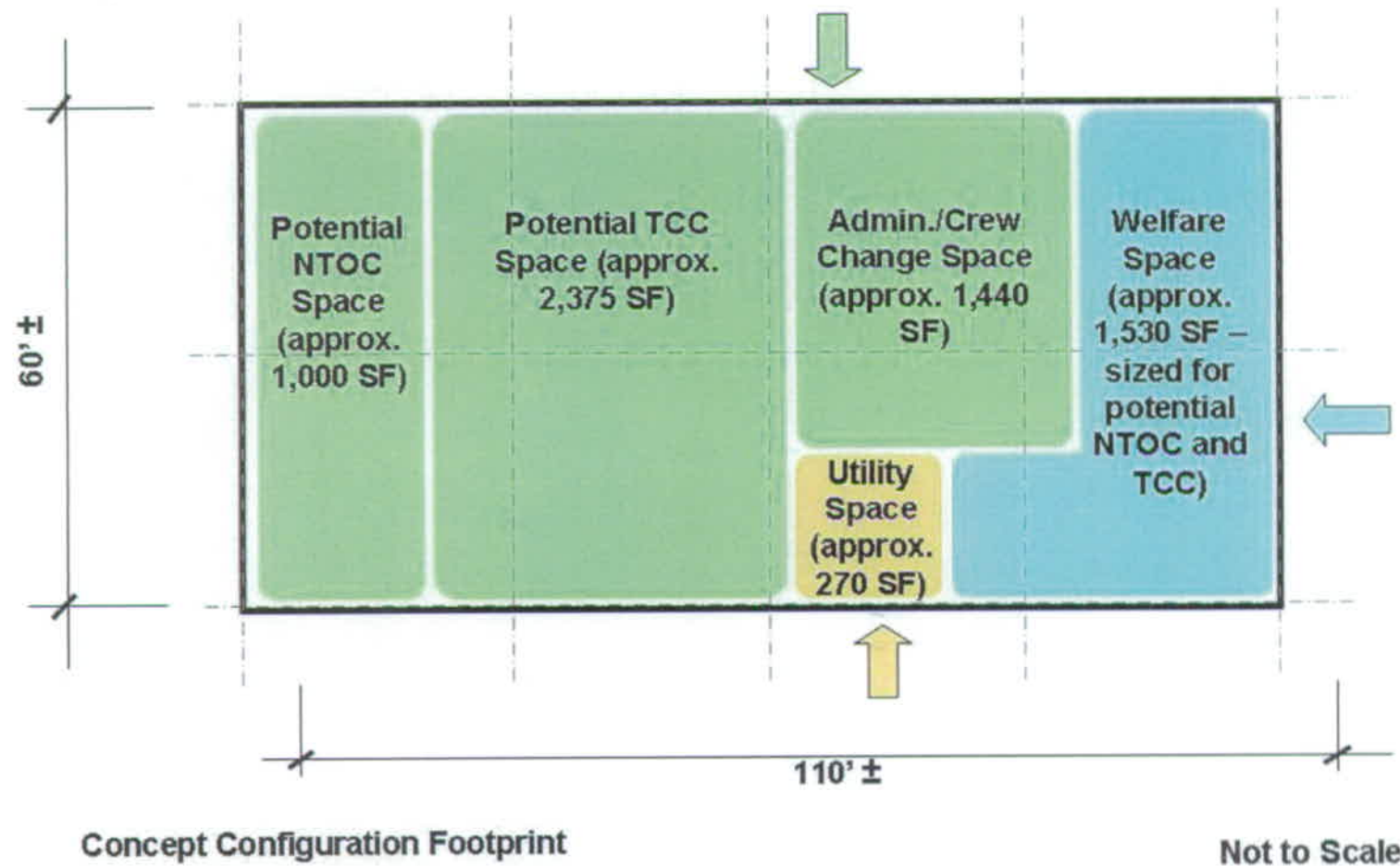


Figure 5-A. CRC Staging Yard/Office Yard and Crew Change Facility (Potential TCC and NTOC Location)
Concept Configuration Footprint

5.0 Caliente Rail Corridor Staging Yard

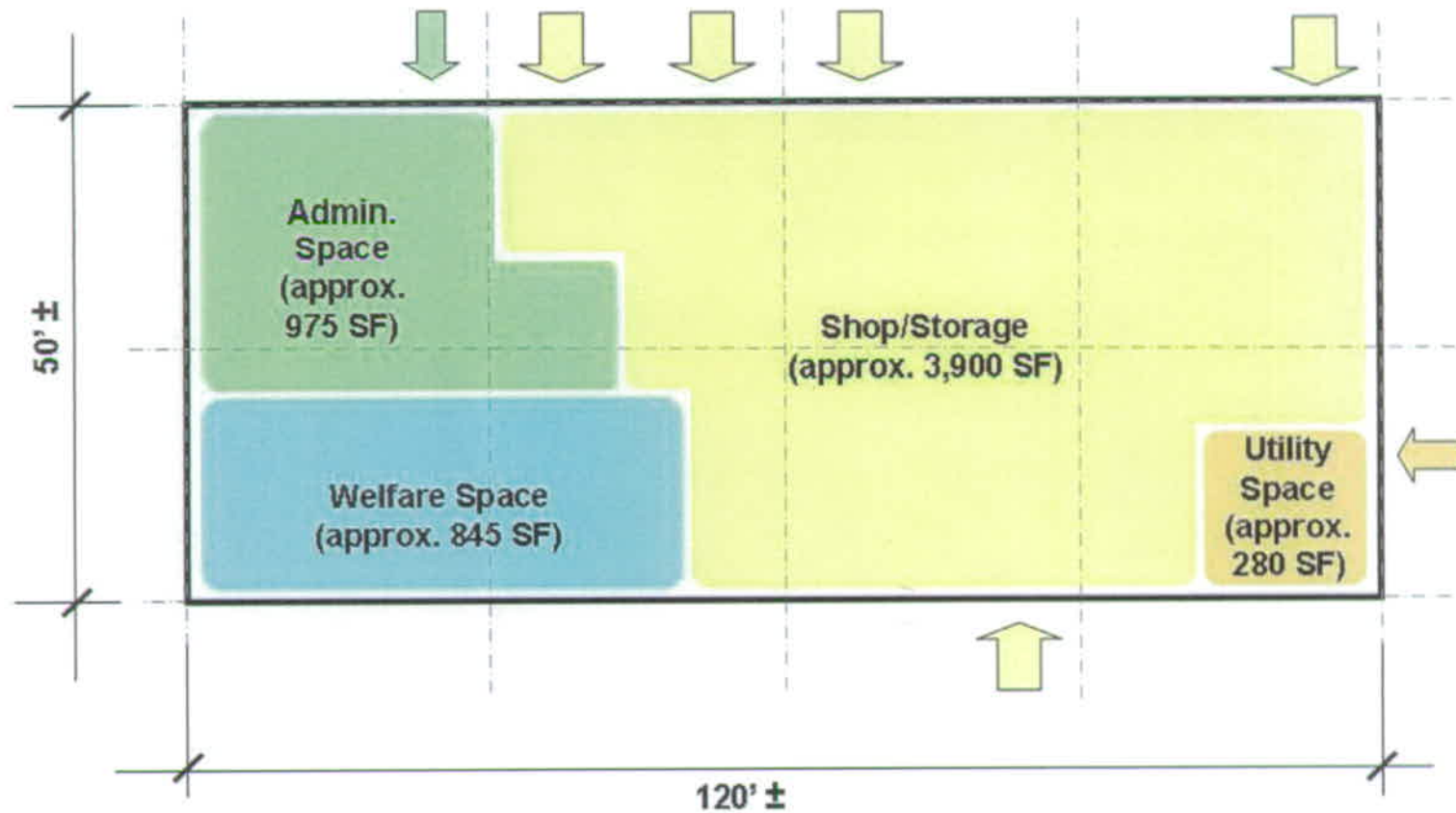
Table 5-B. CRC Staging Yard/Satellite MOW Building–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE SPACE	Track Inspector	100	
	Track and Maintenance Crew (3 persons and a boom truck)	240	(3) persons sharing combined area at 80 sq ft per person
	Signal Maintainer	100	
	Field Maintainer	100	
	Reception Area	100	
	Circulation at 20 percent	135	
	Contingency at 25 percent	200	
	Total Net sq ft for Area	975	
WELFARE SPACE	Men's Locker	30	Full height shared lockers; assumes 75 percent staff are male; 75 percent of (7) total lockers required = (5) lockers @ 6 sq ft per person = 30 sq ft
	Men's Shower	40	Assumes (1) shower total - 40 sq ft for ADA
	Men's Restroom	75	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 6,000 sq ft divided by 200) = (30) occupants with a 50/50 split Men/Women (15 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, and (1) lavatory at 15 sq ft and (1) urinal at 15 sq ft. (Circulation is included in group total below)
	Women's Locker	15	Full height shared lockers; assumes 25 percent staff are female; 25 percent of (7) total lockers required = (2) lockers @ 6 sq ft per person = 12 sq ft
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA
	Women's Restroom	60	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 6,000 sq ft divided by 200) = (30) occupants with a 50/50 split Men/Women (15 Women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft and (1) lavatory at 15 sq ft. (Circulation is included in group total below)
	Lunchroom/Breakroom	300	Based on (10) total staff at any one time at 30 sq ft person = 300 sq ft
	Circulation at 20 percent	115	
	Contingency at 25 percent	170	
	Total Net sq ft for Area	845	

5.0 Caliente Rail Corridor Staging Yard

Table 5-B. CRC Staging Yard/Satellite MOW Building–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
SHOP / STORAGE	Shop / Storage	3,000	
	Shipping and Receiving Room	120	
	Contingency at 25 percent	780	
	Total Net sq ft for Area	3,900	
UTILITY	Electrical, Mechanical, Utility, Telephone/Data Room	180	
	Circulation at 20 percent	40	
	Contingency at 25 percent	60	
	Total Net sq ft for Area	280	
	Total Gross Square Feet	6,000	



Concept Configuration Footprint

Not to Scale

Figure 5-B. CRC Staging Yard/Satellite MOW Building—Concept Configuration Footprint

5.0 Caliente Rail Corridor Staging Yard

5.5 SITE LOCATIONS

As noted earlier in this report, three locations are under consideration for the staging yard. These locations are discussed individually below.

Caliente Indian Cove Alternative – The Caliente Indian Cove site is located about one mile northeast of Caliente. The yard would lay parallel to and about 50 feet east of US Highway 93 in a north-south alignment.

Caliente Upland Alternative – The Caliente Upland site is located about 4 miles northeast of Caliente. The yard would lay somewhat parallel to US Highway 93, but separated by a range of about 250 – 1,300 feet. The yard would lay in a general northeast-southwest alignment.

Eccles North Alternative – The Eccles North site is located about 8 miles north of Eccles. The yard would lay in a north-south alignment about 3,000 feet east of US Highway 93.

5.6 UTILITIES

All sites require power, water, propane or natural gas, water treatment and sewage systems. It is assumed that all alternates would use commercial electric power obtained from the power distribution system with diesel powered stand by generators. Water would be obtained from locally drilled wells. Propane or natural gas would be obtained from onsite storage tanks. Water treatment and sewage would be handled by on-site treatment systems.

Storm Drainage – Approximately 0.5 acre would be required for a 6-foot-deep detention pond. This is based on the buildings and paved areas making up about 6.0 acres, and the track and unpaved areas making up about 42.0 acres at this site. A runoff rate of 1.7 cfs was computed from these areas, and a 24-hour capacity was used.

Water (Domestic & Fire) – Domestic water usage is estimated at 5,500 gallons per day (gpd) based on an average of 50 gpd per occupant. A 110,000 gallon tank would be needed for fire protection, assuming a one-hour flow period with a 20 percent safety factor. Both of these values include TCC/NTOC personnel.

Sanitary Sewer – Conservatively using the same calculations as for domestic water usage, this site would produce an estimated 5,500 gpd. An undetermined portion of this quantity may be generated as industrial waste and would be dependent on the operations performed at the staging yard.

Electrical Power – The staging yard facilities (yard office/crew change facility and satellite MOW) are estimated to have a normal power demand of 386 kilowatts with the TCC/NTOC and 290 kilowatts without the TCC/NTOC.

Personnel identified as TCC and NTOC will either be located in the staging yard or the EOL facility, not both facilities.

5.7 ACCESS AND ROADS

Common to all yard sites, a paved two-lane access road would extend the length of the yard on the east side. The road would dead-end at the north end of the yard with a turn around provided. At the south end of the yard, for the two Caliente alternatives, the access road would curve to the west for a junction with US Highway 93. For the Eccles option, an access road would continue south and connect with Beaver Dam Road. Beaver Dam road connects with US Highway 93.

5.8 EXISTING FACILITIES

There are no existing facilities at any of the three sites under consideration.

5.0 Caliente Rail Corridor Staging Yard

5.9 DRAWINGS

- Figure 5-C. CRC Staging Yard–Eccles North
- Figure 5-D. CRC Staging Yard–Caliente Indian Cove
- Figure 5-E. CRC Staging Yard–Caliente Upland
- Figures 5-F and 5-G. Building Renderings

See Figures 5-F and 5-G for a concept renderings of the staging yard/yard office and crew change facility office and the staging yard/satellite MOW facility, respectively.

5.0 Caliente Rail Corridor Staging Yard

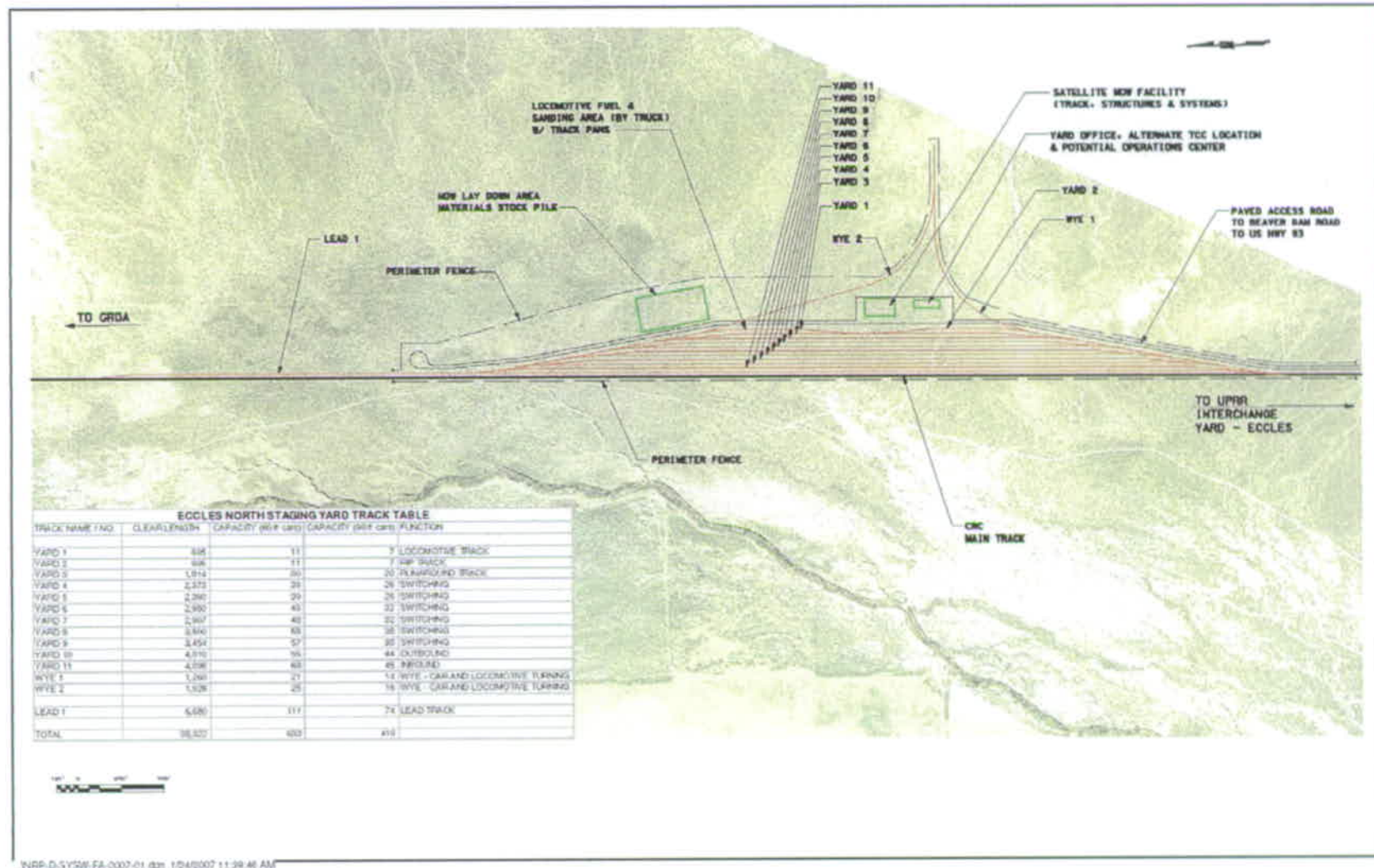


Figure 5-C. CRC Staging Yard-Eccles North

5.0 Caliente Rail Corridor Staging Yard

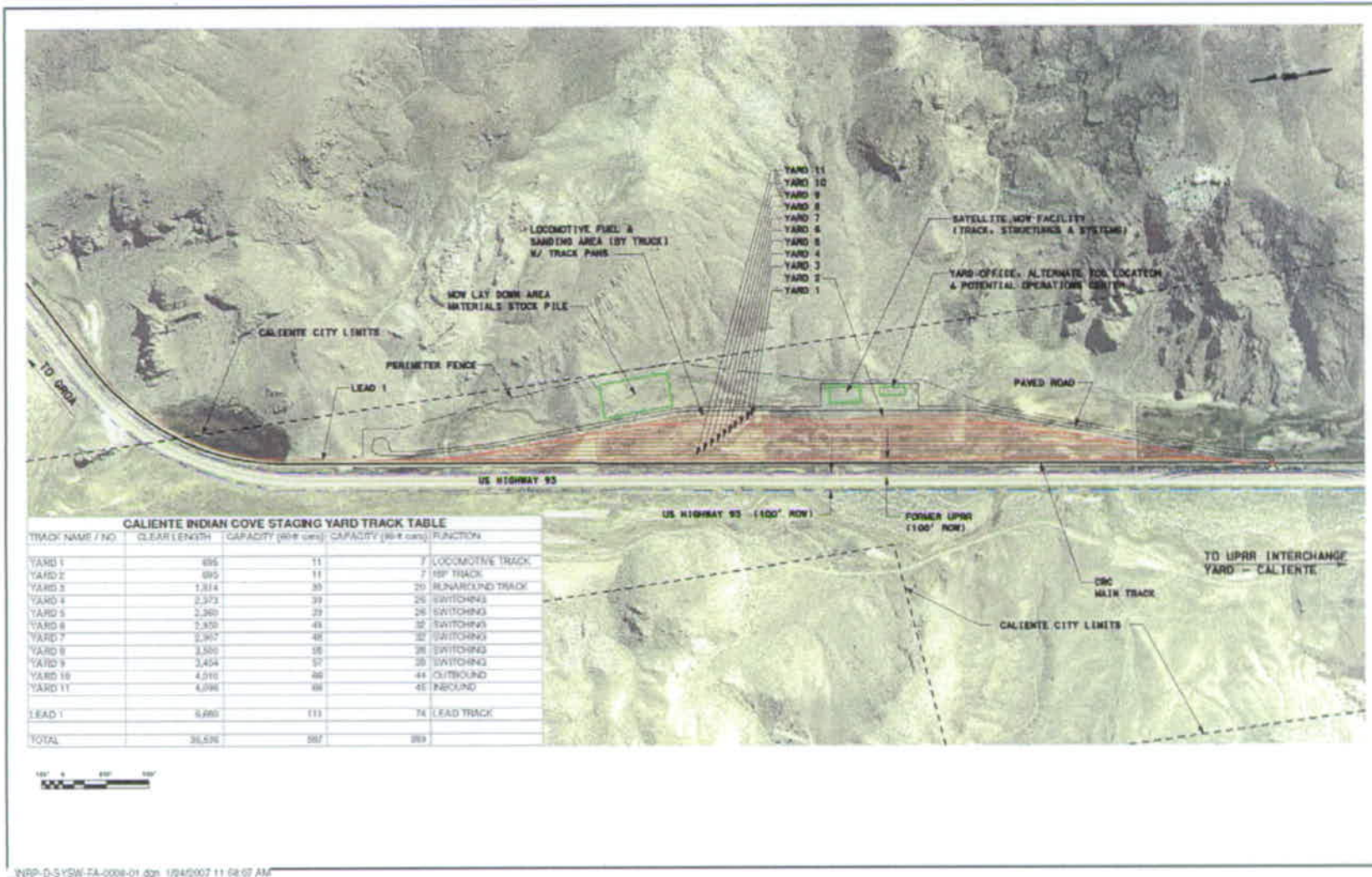
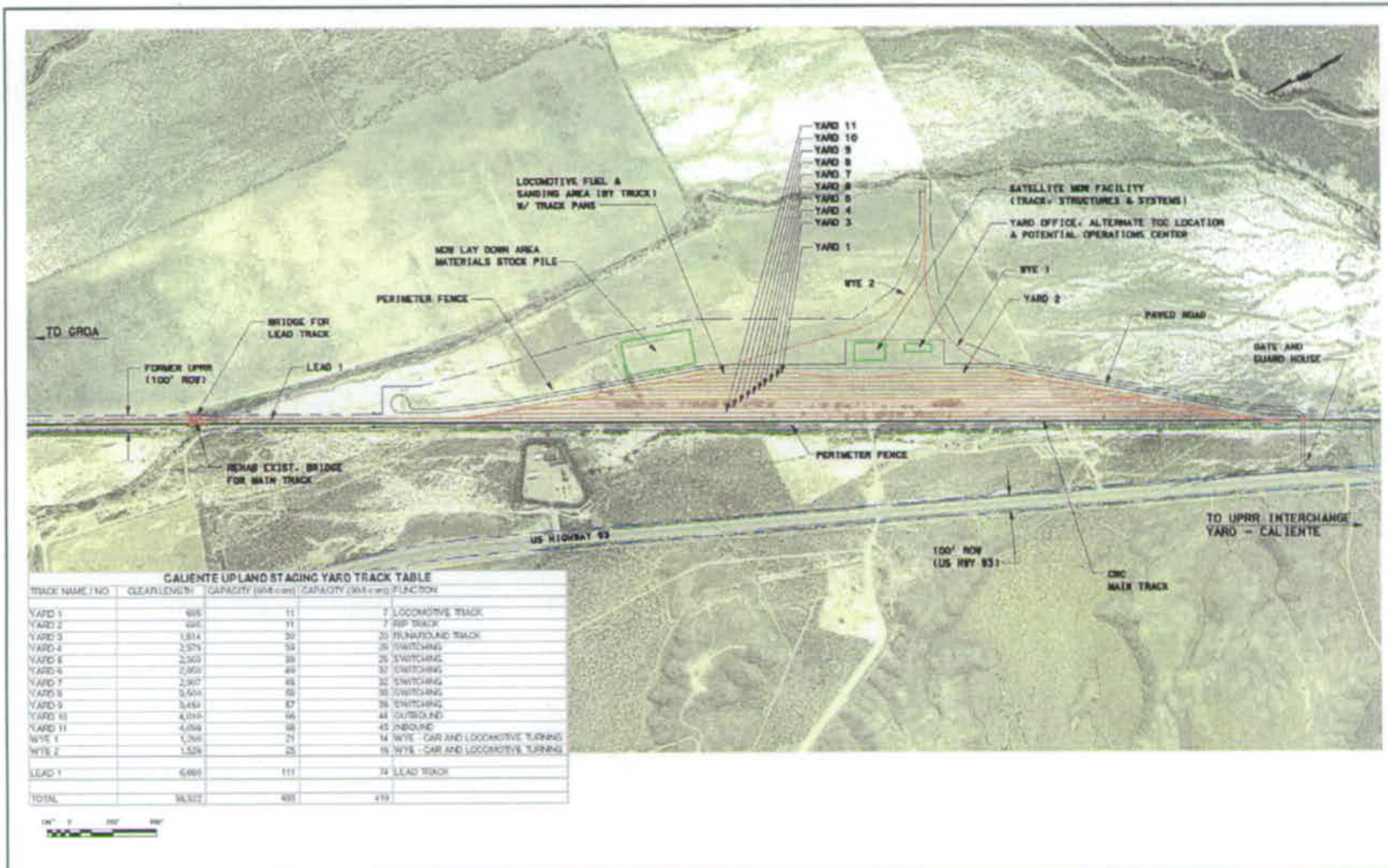


Figure 5-D. CRC Staging Yard–Caliente Indian Cove

5.0 Caliente Rail Corridor Staging Yard



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Figure 5-E. CRC Staging Yard-Caliente Upland

5.0 Caliente Rail Corridor Staging Yard

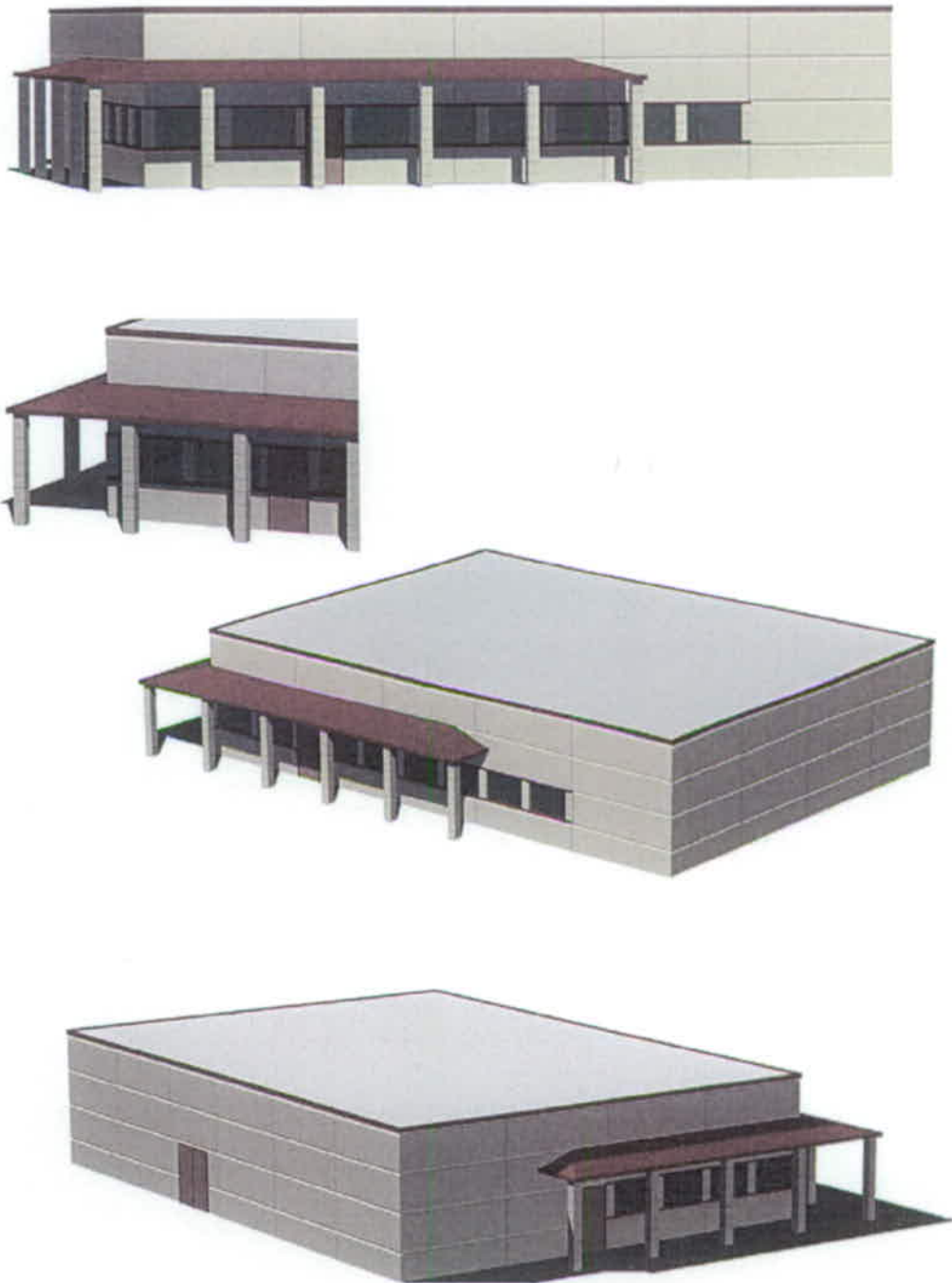


Figure 5-F. CRC Staging Yard/Yard Office and Crew Change Facility (Potential TCC and NTOC Location)
Concept Building Rendering

5.0 Caliente Rail Corridor Staging Yard

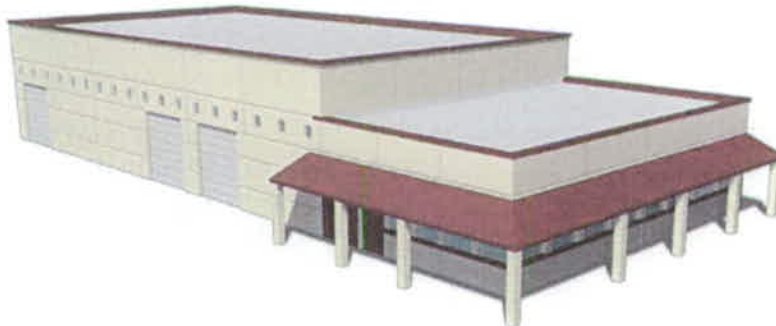


Figure 5-G. CRC Staging Yard/Satellite MOW Facility Concept Facility Rendering

6.1 LOCATION, PURPOSE, AND FUNCTION

NRL trains carrying casks loaded with SNF and HLW, and general freight in support of GROA construction and ongoing support would operate from the staging yard to the EOL facility. The EOL is located approximately one mile south of the Cask Receipt Security Station located within the GROA.

The purpose of the EOL facilities is to provide for the following:

- Termination for the main track movement of cask trains
- Rearrangement of train consists and for the delivery of loaded cask cars to the repository receiving inspection area
- Holding buffer cars
- Receipt (from the repository) and temporary storage of empty cask cars, casks on rail cars, and repair of bad order rail cars
- Assembly of outgoing trains destined to the staging yard
- Shuttling of empty cask cars, buffer cars, to the CMF
- Receipt and delivery to the repository of waste packages, construction materials, and fuel oil, including dedicated construction tracks
- A potential base for the TCC
- A building to support of operations and maintenance, including the servicing, inspection, and maintenance of cars and locomotives
- A base to support escort cars and personnel associated with incoming (and possibility outgoing) cask train movements
- Location for potential for the NTOC
- Location for rail car and locomotive light repair facility

6.2 BASIS OF DESIGN

6.2.1 Function Parameters

- 50-year operational life
- Rail yard area 420 feet wide by 4,050 feet long (40 acres); not including required access road and parking area
- Locomotive and rail car turnaround "wye" track
- Tracks to GROA entrance
- Spur track for fuel oil and locomotive fuel delivery
- Construction materials yard in support of GROA construction
- GROA rail access protected by interlocked derails
- Locomotive fuel storage tank – 237,000 gallons separate from GROA fuel storage (one month reserve)

6.0 End-of-Line Facility

- Yard tracks; including receiving track, departure track, train make-up tracks, storage tracks, CMF leads, etc
- Locomotive storage track (engine ready track)
- Administrative and crew change facility
- Satellite MOW facility
- Light locomotive running repair facility
- Light rail car repair at RIP track
- Escort car servicing with stand-by power
- Locomotive fueling and sanding
- Train crew check-in
- Lodging for train crew, escort car and other personnel
- Rail car light maintenance and all FRA safety test/inspections

6.2.2 Assumptions

- The CMF may be co-located with the EOL facility and occupy a rectangular area of approximately 750 feet by 1,125 feet
- Gasoline for vehicles would be available off-site
- The operating contract for the rail line would be separate from the CMF contract
- TCC (potential location)
- NTOC (potential location)

6.3 TRACK LAYOUT

6.3.1 Tracks and Functions

As shown on the site plans, the following tracks make up the EOL yard:

- CMF access tracks
- Run around track
- Isolated inbound receiving tracks
- Outbound departure track
- Yard switching tracks
- Escort car servicing tracks
- Locomotive and car shop
- Locomotive servicing track
- Construction material unloading track
- Construction material tracks

- GROA access tracks
- Wash track
- Oil spur track
- Tracks forming a single wye configuration

These tracks are depicted in Figure 6-A.

6.4 BUILDINGS

6.4.1 Buildings and Functions

If this location is selected for the TCC and NTOC it would be established at the EOL facility. Train movements will be dispatched and monitored from this location and coordination with the UPRR for interchange would be handled at this site. All on-track maintenance activities would be coordinated from this office. The TCC would also be responsible for the calling of train crews who will report here or to the staging yard for work assignments. The TCC would communicate and coordinate with the NTOC and GROA as necessary. Other office functions of the facility would handle administrative functions. The approximate dimensions for the building are 93 feet wide by 130 feet long; occupying approximately 12,000 sq ft.

Satellite MOW Facility – This facility will support maintenance activities in conjunction with the MOW Headquarters. Primarily, this satellite facility will handle the maintenance needs of the EOL yard and some portion of the main track between the EOL facility and the Tonopah area. The building will have space for offices, spare parts storage, tools, and small track maintenance machinery. There will also be an outside material lay down area. The approximate dimensions for the buildings are 50 feet wide by 120 feet long; occupying approximately 6,000 sq ft.

Locomotive and Car Light Repair Facility – As many as 10 locomotives will be on hand for train movements between Caliente and the repository, for MOW functions, and for yard switching services. Light running repair, required FRA safety inspections, and NRL inspections of locomotives and cars will be performed at the EOL facilities. American Railway Engineering and MOW Association defines light running repair and service for locomotives consisting of any work involving oiling, lubricating, testing, minor adjustments, semi-annual and monthly inspections, and repairs. Such a facility would contain provisions for:

- Lubricating oil supply
- Lubricating oil drainage and handling
- Used oil filters handling
- Water supply systems (raw and treated)

6.0 End-of-Line Facility

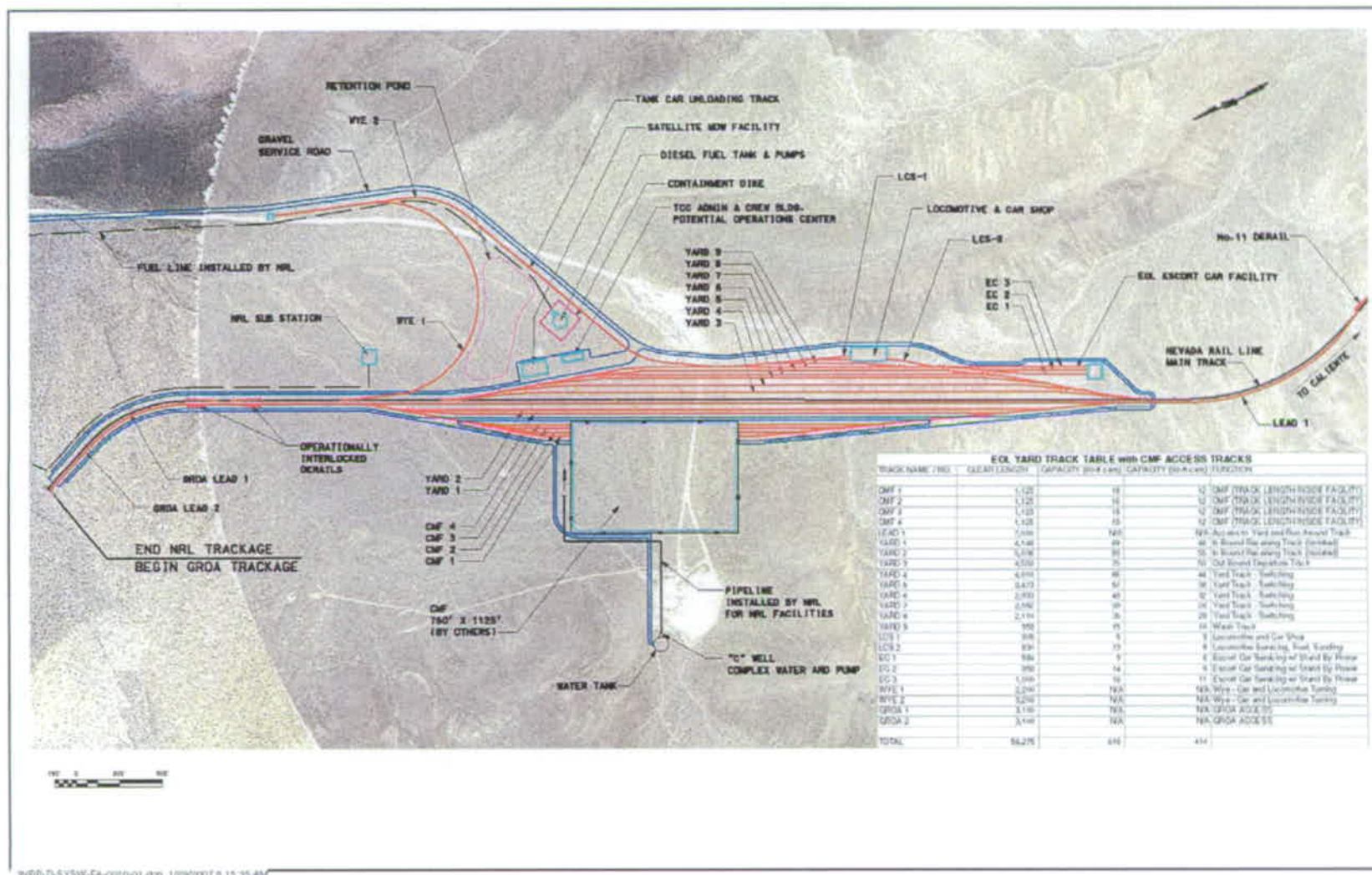


Figure 6-A. EOL Yard

6.0 End-of-Line Facility

- Radiator water and radiator water reclaim system
- Sanitary sewer separated from industrial waste system
- Compressed air system
- Electrical cleaning solvent handling and disposal of spent solvent
- Anti-slip floors in specific areas
- Fire protection
- Natural gas or propane
- Light repair shops provided with pits, elevated platforms, and light capacity cranes
- Office area
- Locker, lunch, and toilet facilities
- Store room for tools and parts
- Welding equipment
- Hazardous material storage
- Locomotive toilet servicing
- Locomotive fueling, sanding, and washing functions

Heavy repair of locomotives would be performed, on a scheduled basis and for major break downs, at an off-site commercial locomotive repair facility. Locomotives would be moved by rail to the repair facilities. The approximate dimensions for this building are 100 feet wide by 250 feet long, occupying approximately 25,000 sq ft.

Escort Car Facility – An escort car layover facility would be incorporated to support the servicing of escort cars. This facility would have provisions for cleaning of cars, restocking of supplies, and toilet servicing. The area would also be equipped with “stand-by power” to supply electricity to the escort cars to maintain air conditioning, lighting, and other features during layover periods. The approximate dimensions for this building are 100 feet wide by 100 feet long, occupying approximately 10,000 sq ft.

Tank Farm and Locomotive Fueling – A fuel tank and fuel delivery system will be provided within the EOL facility area. Assumption is for a 237,000 gallon tank size for locomotive fuel, based on a one month supply reserve. Diesel fuel would be delivered to the storage tank via rail tank cars.

In all the options described, the area where fueling takes place would require track pans or other positive methods to collect dripping oil and spilled fuel from the locomotives. Additionally, the area where locomotives are to be staged (engine ready tracks) will have a similar collection and treatment system.

6.4.2 Space Sizing Tables / Concept Configuration Footprints

An individual facility spreadsheet, “space sizing table”, was created by assigning an appropriate sq ft allocation for each assumed staffing position. The sq ft assignments were included under four functional space categories – Administrative (or Administrative/Crew Change), Welfare, Shop/Storage, or Utility. (Refer to 3.1.3 Staffing / Sizing, for further explanation of the methodology and processes for determining sq ft allocations.)

6.0 End-of-Line Facility

Once a square foot total was determined for each functional category shown in the space sizing table, “blocks” of space indicating the total approximate square feet required were arranged together to form a footprint of how the space might be conceptually laid out. The block diagram is provided as a supplement with each space sizing table and is shown as the “concept configuration footprint”. (Refer to Section 3.1.2 Buildings, for further explanation of the methodology and processes for creating the space sizing table and concept configuration footprint.)

Each area on the concept configuration footprint is assigned a color which correlates with the respective functional space category shown on the space sizing table – Administration (or Administrative/Crew Change) (Green), Welfare Space (Blue), Shop/Storage (Yellow) and Utility (Orange). For simplicity, areas in plan view are shown as rectangular in shape. For the purpose of this layout, block arrows are shown as an indication of possible entry/egress points that may be required. Also, a grid based on a spacing of 25 feet to 30 feet to indicate a potential future structural framework for the building, provides a logical starting point for the conceptual arrangement.

See the following space sizing tables and concept configuration footprints for the facilities located at the EOL yard:

- Table 6-A. EOL Yard/Administrative Office and Crew Change Facility (Potential TCC and NTOC)–Space Sizing Table
- Figure 6-B. EOL Yard/Administrative Office and Crew Change Facility (Potential TCC and NTOC)–Concept Configuration Footprint
- Table 6-B. EOL Yard/Satellite MOW Facility–Space Sizing Table
- Figure 6-C. EOL Yard/Satellite MOW Building–Concept Configuration Footprint
- Table 6-C. EOL/Locomotive and Car Light Repair Facility–Space Sizing Table
- Figure 6-D. EOL/Locomotive and Car Light Repair Facility–Concept Configuration Footprint
- Table 6-D. EOL/Escort Car Facility–Space Sizing Table
- Figure 6-E. EOL/Escort Car Facility–Concept Configuration Footprint

6.0 End-of-Line Facility

Table 6-A. EOL Yard/Administrative Office and Crew Change Facility (Potential TCC and NTOC)–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE SPACE / CREW CHANGE SPACE	General Manager (TCC)	300	
	Director of Operations or Director of Transportation (TCC)	300	
	Movement Director / Chief Dispatcher (TCC)	150	
	Chief Crew Dispatcher (TCC)	125	
	Assistant Movement Director (TCC)	125	
	Train Dispatchers (TCC)	300	(5) Dispatchers share 3-shifts 7 days/week. Assume that no more than (3) will be present at one time. Central work area with 100 sq ft per person.
	Crew Dispatchers (TCC)	300	(5) Dispatchers share 3-shifts 7 days/week. Assume that no more than (3) will be present at one time. Central work area with 100 sq ft per person.
	ATM / Road Foreman of Engines	200	Two (2) ATMs to share workspace. Assumes each has a shift and there is some overlap.
	Trainmaster West	150	
	Yardmaster	150	
	Conductors	150	Check-in / check-out shared workspace for all conductors. Assumes no more than three (3) are present at one time. Assume 50 sq ft per person.
	Engineers	150	Check-in / check-out shared workspace for all engineers. Assumes no more than three (3) are present at one time in the yard office. Assume 50 sq ft per person.
	Reception Area	150	
	Administrative Storage, Filing and Supplies	250	
	Circulation at 20 percent	555	
	Contingency at 25 percent	840	Can accommodate required space for security personnel or additional administrative personnel that may need to be added
	Potential NTOC	1,000	
	Total Net sq ft for Area	5,195	<i>Approximately 2,375 sq ft is associated with the potential TCC operation</i>

6.0 End-of-Line Facility

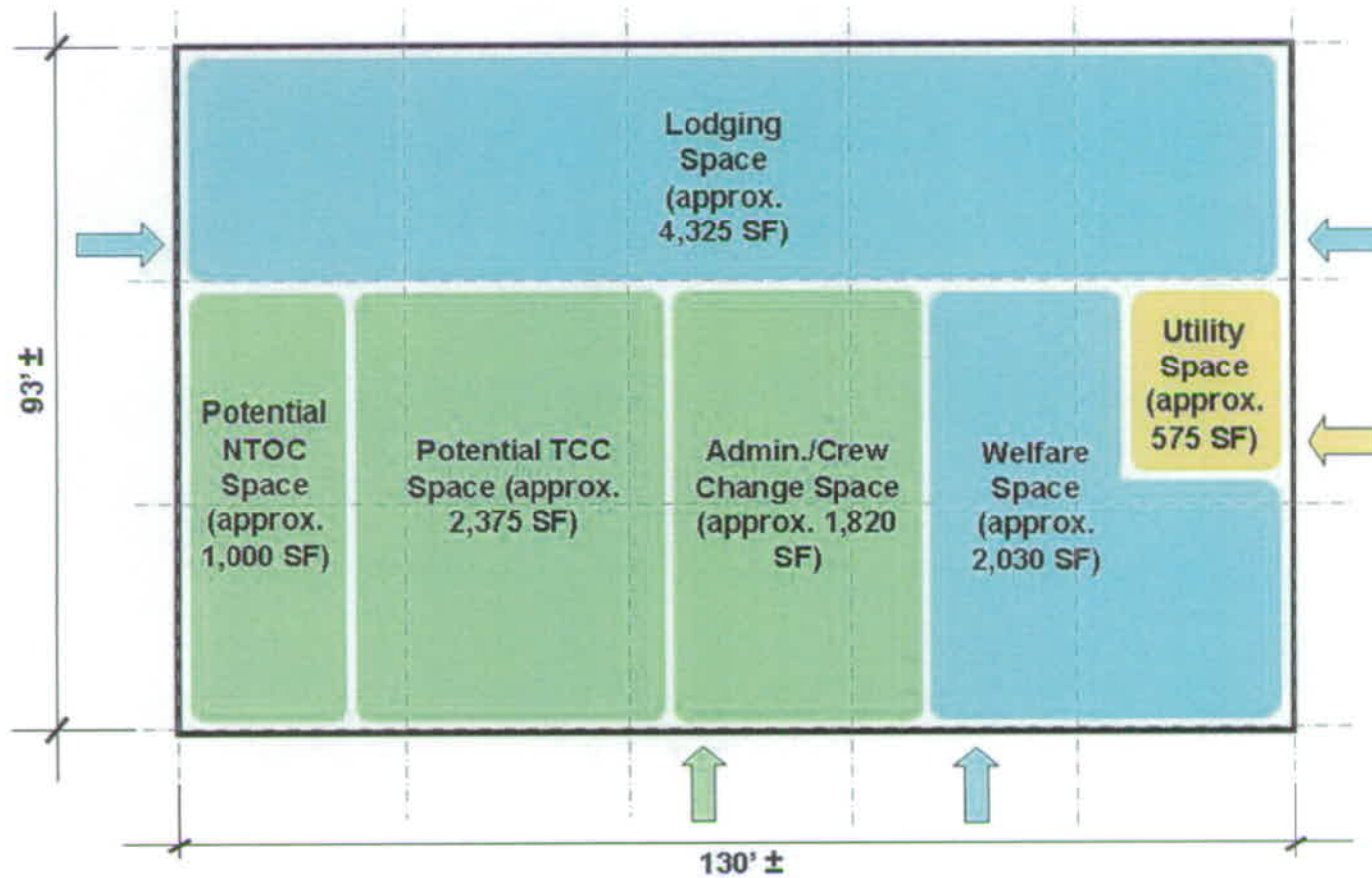
Table 6-A. EOL Yard/Administrative Office and Crew Change Facility (Potential TCC and NTOC)–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
WELFARE SPACE	Men's Locker	75	Full height lockers; assumes 75 percent staff are male of (14) total lockers required = (11) lockers; round up to (12) lockers @ 6 sq ft per person = 72 sq ft
	Men's Shower	65	Assumes (2) showers total - 40 sq ft for ADA shower and 25 sq ft for typical shower; assumes 75 percent male staff.
	Men's Restroom	130	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 7,800 sq ft divided by 200) = (39) occupants with a 50/50 split Men/Women (20 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (1) standard toilet at 25 sq ft, (1) urinals at 15 sq ft, (1) lavatory at 15 sq ft. Add (1) urinals and (1) lavatory assuming that male staff is 75 percent while female staff is 25 percent. (Circulation is included in group total below - the sq ft total is based on the building sq ft without the Lodging function factored in.)
	Women's Locker	40	Full height lockers; assumes 25 percent staff are female of (14) total lockers required = (4) lockers; round up to (6) lockers @ 6 sq ft per person = 36 sq ft
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA shower; assumes 25 percent female staff.
	Women's Restroom	110	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 7,800 sq ft divided by 200) = (39) occupants with a 50/50 split Men/Women (20 women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (2) standard toilets at 25 sq ft, (1) lavatory at 15 sq ft. (Circulation is included in group total below - the sq ft total is based on the building sq ft without the Lodging function factored in.)
	Lunchroom/Breakroom	600	Based on the largest shift at (20) total staff at 30 sq ft person = 600 sq ft
	Conference Room/Training	300	Room will seat (15) @ 20 sq ft per person
	Lodging for Crew Change	3,120	Assume up to (4) crews may need lodging at the same time = 8 hotel rooms complete with private bathroom at 390 sq ft per room = 3120 (Office restroom space is not affected by this building function)
	Circulation at 20 percent for all spaces except Lodging at 10 percent	585	
	Contingency at 25 percent for all space except Lodging at 5 percent	585	
	Total Net sq ft for Area	5,650	<i>Approximately 440 sq ft is associated with the potential TCC and NTOC operations; approx. 3,610 sq ft is associated with lodging</i>

6.0 End-of-Line Facility

Table 6-A. EOL Yard/Administrative Office and Crew Change Facility (Potential TCC and NTOC)–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
SHOP / STORAGE	Contingency at 25 percent		
	Total Net sq ft for Area	0	
UTILITY	Electrical Room	100	
	Mechanical Room	200	
	Utility / Janitor Closet	60	
	Telephone / Data Room	25	
	Circulation at 20 percent	75	
	Contingency at 25 percent	115	
	Total Net sq ft for Area	575	
	Total Gross Square Feet	12,000	<i>Note: Personnel identified as TCC and NTOC will either be located in this facility or at the staging yard / yard office and crew change facility, not both facilities</i>



Concept Configuration Footprint

Not to Scale

Figure 6-B. EOL Yard/Administrative Office and Crew Change Facility (Potential TCC and NTOC)
Concept Configuration Footprint

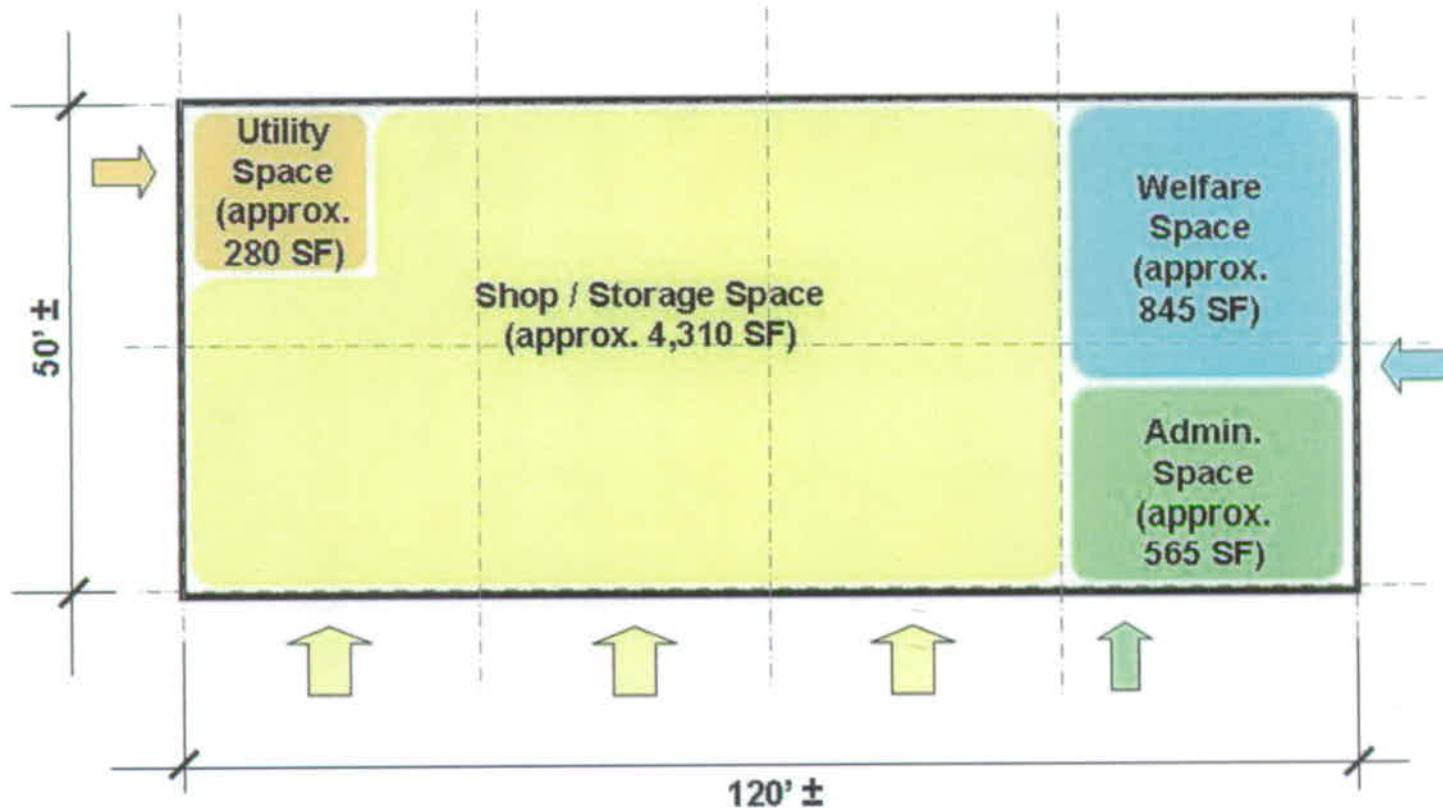
6.0 End-of-Line Facility

Table 6-B. EOL Yard/Satellite MOW Facility--Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE SPACE	Track and Structures Maintenance Staff / Crew	175	Sized for periodic staffing - assume no more than 25-30 percent of staff (from Headquarters and Trackside MOW locations - 17 personnel) would be at the facility at any given time. Size for (5) staff at 35 sq ft per person.
	Signal Staff / Crew	140	Sized for periodic staffing - assume no more than 25-30 percent of communications staff (from Headquarters and Trackside MOW locations - 13 personnel) would be at the facility at any given time. Size for (4) staff at 35 sq ft per person.
	Administrative, Storage, Filing and Supplies	55	
	Circulation at 20 percent	80	
	Contingency at 25 percent	115	
	Total Net sq ft for Area	565	
WELFARE SPACE	Men's Locker	30	Full height shared lockers; assumes 75 percent staff are male; 75 percent of (7) total lockers required = (5) lockers @ 6 sq ft per person = 30 sq ft
	Men's Shower	40	Assumes (1) shower total - 40 sq ft for ADA
	Men's Restroom	75	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 6,000 sq ft divided by 200) = (30) occupants with a 50/50 split Men/Women (15 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, and (1) lavatory at 15 sq ft and (1) urinal at 15 sq ft. (Circulation is included in group total below)
	Women's Locker	15	Full height shared lockers; assumes 25 percent staff are female; 25 percent of (7) total lockers required = (2) lockers @ 6 sq ft per person = 12 sq ft
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA
	Women's Restroom	60	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 6,000 sq ft divided by 200) = (30) occupants with a 50/50 split Men/Women (15 Women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft and (1) lavatory at 15 sq ft. (Circulation is included in group total below)
	Lunchroom/Breakroom	300	Based on (10) total staff at any one time at 30 sq ft person = 300 sq ft
	Circulation at 20 percent	115	
	Contingency at 25 percent	170	
	Total Net sq ft for Area	845	

Table 6-B. EOL Yard/Satellite MOW Facility–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
SHOP / STORAGE	Shop / Storage	3,350	
	Shipping and Receiving Room	120	
	Contingency at 25 percent	840	
	Total Net sq ft for Area	4,310	
UTILITY	Electrical, Mechanical, Utility, Telephone/Data Room	180	
	Circulation at 20 percent	40	
	Contingency at 25 percent	60	
	Total Net sq ft for Area	280	
	Total Gross Square Feet	6,000	



Concept Configuration Footprint

Not to Scale

Figure 6-C. EOL Yard/Satellite MOW Building-Concept Configuration Footprint

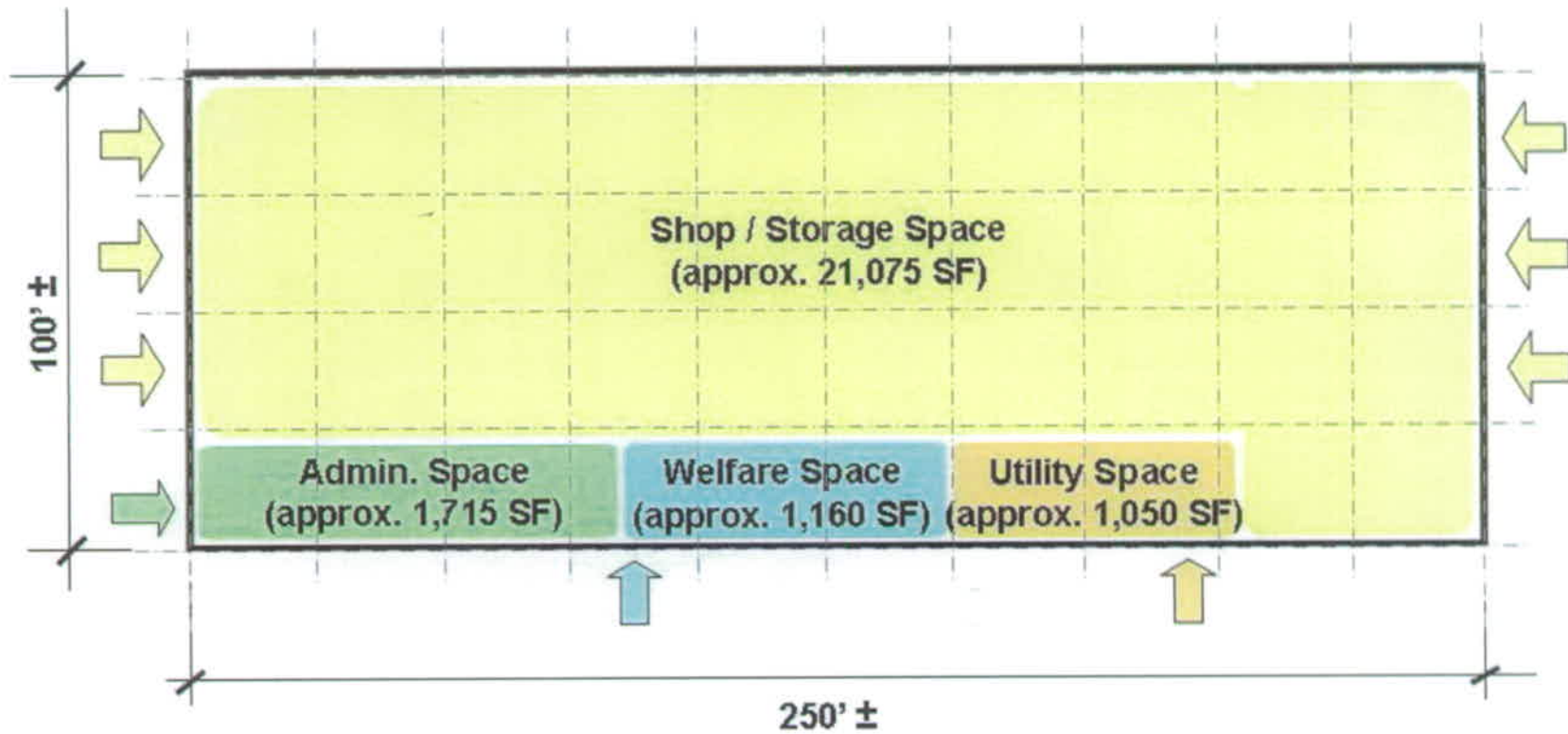
6.0 End-of-Line Facility

Table 6-C. EOL/Locomotive and Car Light Repair Facility–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE SPACE	Locomotive and Car Maintenance Supervisor	150	
	Storekeeper - Rolling Stock Maintenance	150	
	Shop Foreman	125	
	Shop Mechanics	500	Assumes that (5) mechanics at 100 sq ft per station
	Administrative Storage, Filing and Supplies	200	
	Circulation at 20 percent	230	
	Contingency at 25 percent	360	
	Total Net sq ft for Area	1,715	
WELFARE SPACE	Men's Locker	35	Full height shared lockers; assumes 75 percent staff are male; 75 percent of (8) total lockers required = (6) lockers @ 6 sq ft per person = 36 sq ft
	Men's Shower	80	Assumes (2) showers total - 40 sq ft for ADA
	Men's Restroom	180	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 25,000 sq ft divided by 200) = (125) occupants with a 50/50 split Men/Women (63 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (3) standard toilets at 25 sq ft, and (2) lavatories at 15 sq ft and (2) urinals at 15 sq ft. (Circulation is included in group total below)
	Women's Locker	15	Full height shared lockers; assumes 25 percent staff are female; 25 percent of (8) total lockers required = (2) lockers @ 6 sq ft per person = 12 sq ft
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA
	Women's Restroom	175	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 25,000 sq ft divided by 200) = (125) occupants with a 50/50 split Men/Women (63 Women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, and (4) toilets at 25 sq ft, and (2) lavatory at 15 sq ft. (Circulation is included in group total below)
	Lunchroom/Breakroom	240	Based on (8) total staff at any one time at 30 sq ft person = 240 sq ft
	Circulation at 20 percent	155	
	Contingency at 25 percent	240	
	Total Net sq ft for Area	1,160	

Table 6-C. EOL/Locomotive and Car Light Repair Facility-Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
SHOP / STORAGE	Shop	12,500	
	Storage	4,200	
	Shipping and Receiving Room	200	
	Contingency at 25 percent	4,175	
	Total Net sq ft for Area	21,075	
UTILITY	Electrical, Mechanical, Utility, Telephone/Data Room	700	
	Circulation at 20 percent	140	
	Contingency at 25 percent	210	
	Total Net sq ft for Area	1,050	
	Total Gross Square Feet	25,000	



Concept Configuration Footprint

Not to Scale

Figure 6-D. EOL/Locomotive and Car Light Repair Facility—Concept Configuration Footprint

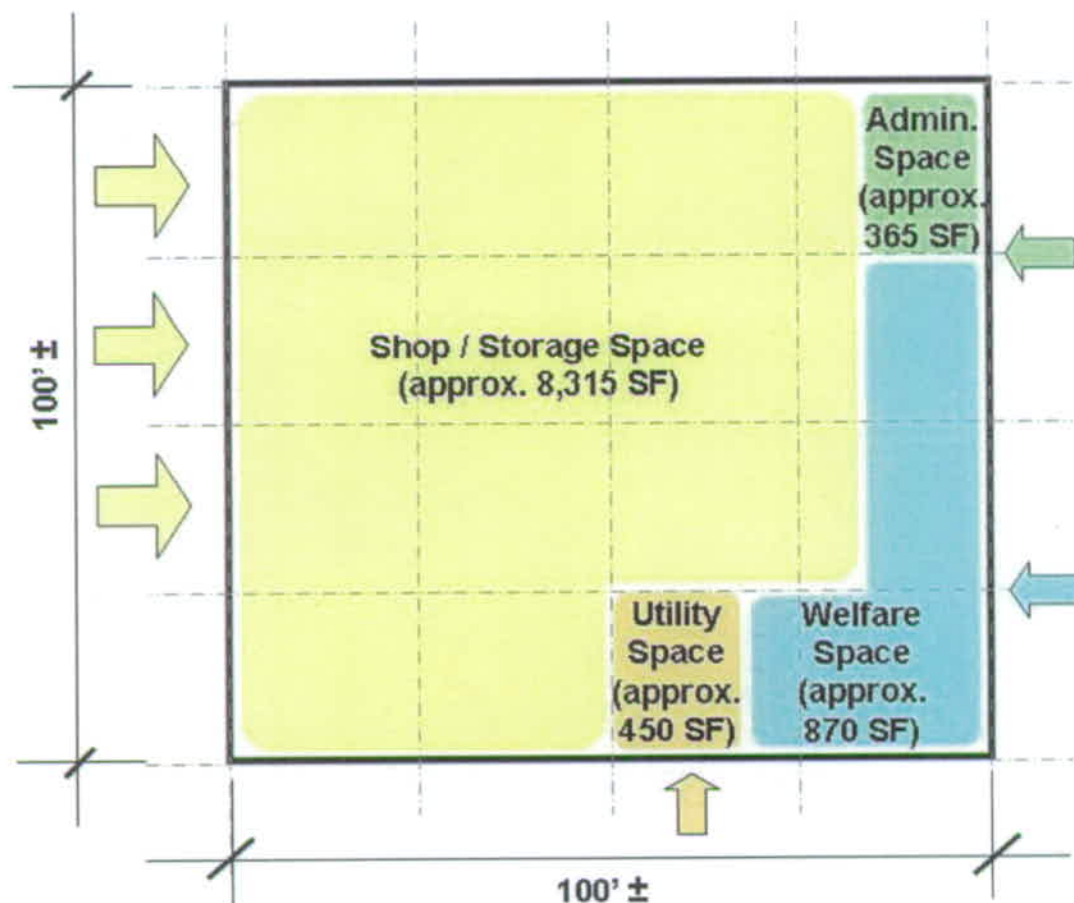
Table 6-D. EOL/Escort Car Facility–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE SPACE	Escort Car Staff	240	
	Circulation at 20 percent	50	
	Contingency at 25 percent	75	
	Total Net sq ft for Area	365	
WELFARE SPACE	Men's Locker	35	Full height shared lockers; assumes 75 percent staff are male; 75 percent of (8) total lockers required = (6) lockers @ 6 sq ft per person = 36 sq ft
	Men's Shower	40	Assumes (1) shower total - 40 sq ft for ADA
	Men's Restroom	100	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 10,000 sq ft divided by 200) = (50) occupants with a 50/50 split Men/Women (25 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (1) standard toilets at 25 sq ft, and (1) lavatories at 15 sq ft and (1) urinals at 15 sq ft. (Circulation is included in group total below)
	Women's Locker	15	Full height shared lockers; assumes 25 percent staff are female; 25 percent of (8) total lockers required = (2) lockers @ 6 sq ft per person = 12 sq ft
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA
	Women's Restroom	110	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 10,000 sq ft divided by 200) = (50) occupants with a 50/50 split Men/Women (25 Women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, and (2) toilets at 25 sq ft, and (1) lavatory at 15 sq ft. (Circulation is included in group total below)
	Lunchroom/Breakroom	240	Based on (8) total staff at any one time at 30 sq ft person = 240 sq ft
	Circulation at 20 percent	115	
	Contingency at 25 percent	175	
	Total Net sq ft for Area	870	

6.0 End-of-Line Facility

Table 6-D. EOL/Escort Car Facility–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
SHOP / STORAGE	Shop	5,500	
	Storage	1,150	
	Contingency at 25 percent	1,665	
	Total Net sq ft for Area	8,315	
UTILITY	Electrical, Mechanical, Utility, Telephone/Data Room	300	
	Circulation at 20 percent	60	
	Contingency at 25 percent	90	
	Total Net sq ft for Area	450	
	Total Gross Square Feet	10,000	



Concept Configuration Footprint

Not to Scale

Figure 6-E. EOL/Escort Car Facility—Concept Configuration Footprint

6.0 End-of-Line Facility

6.5 SITE LOCATION

The EOL yard is located approximately one mile southwest of the GROA boundary, along the main track.

6.6 UTILITIES

Storm Drainage – Approximately 1.6 acres would be needed for a 6-foot deep detention pond. This is based on the buildings and paved areas making up about 13.0 acres, and track and unpaved areas making up about 127.0 acres at this site. A runoff rate of 4.9 cfs was computed from these areas, and a 24-hour capacity was used.

Water (Domestic & Fire) – Water for both fire protection and general use would be available from the "Well C" system with appropriate pipelines to serve the facility. Domestic water consumption for this site is estimated at 6,000 gpd, including 10 locomotives or cars per day utilizing the train washer, building occupants using an average of 50 gpd, irrigation, and additional building and yard uses. A 220,000 gallon tank would be needed for fire protection, based on building square footage and assuming a one-hour flow period with a 20 percent safety factor.

Sanitary Sewer – Conservatively using the same calculations as for domestic water usage, this site would produce an estimated 6,000 gpd. Included in this amount is an unknown quantity of industrial waste generated from operations in the EOL yard.

Electrical Power – The EOL yard facilities (yard office/crew change facility and satellite MOW) are estimated to have a normal power demand of 531 kilowatts with the TCC/NTOC and 438 kilowatts without the TCC/NTOC. The locomotive and car light repair and escort car shop areas are estimated to have a normal power demand of 284 kilowatts. In a separate comparison, all EOL yard buildings (approximately 53,000 sq.ft.) required a power demand of 588 kilowatts based on a similar heavy repair facility. While this value is less than the combination office/MOW/light repair/escort car estimates above, it is within the same general range. Total demand including yard lighting and other railroad support facilities would be 6 megawatts – 13.8 kilovolts. This value does not include power requirements for the CMF.

Gas – It is assumed that the EOL facility may require the use of natural gas or propane for, at least, the train washer and possibly other industrial uses. In this case, natural gas or propane would be transported to the facility site and stored in onsite storage tanks. The use of electrical heating units and water heaters would not eliminate the need for compressed gas at this site.

Communication Requirements – Approximately 75 conventional phone lines, 50 broadband internet connections, five secure phone lines, fiber optic line for closed circuit television and data communication link and radio communications for railroad operations, MOW and crew-to-crew, in conjunction with the centralized traffic control rail signal system

Whenever possible, utilities would be accessed by tapping into the same source as GROA utilities. A separate substation for electrical power would supply the facility. Other services, such as sewer, water treatment, and natural gas that would not be readily accessible via GROA sources, would be handled by dedicated systems at the EOL facility. These would include industrial waste water treatment / retention systems, and natural gas or propane tanks.

Personnel identified as TCC and NTOC will either be located in the staging yard or the EOL yard, not both facilities.

6.7 ACCESS AND ROADS

Track/Site Roadways – The rail line entering the GROA would have a parallel roadway from the receiving yard to the GROA facility for escort vehicles to follow the transfer of a loaded cask rail car to

6.0 End-of-Line Facility

the hand off point. A separate access road would be used by legal weight trucks carrying loaded and empty casks, and by repository personnel associated with the receiving and inspection of incoming and outgoing cask shipments (rail and road). Additionally, EOL yard access roadways would be provided adjacent to certain tracks for the inspection of inbound and outbound trains and for the RIP track functions required for the maintenance of rail cars.

End-of-Line Facilities Access Road – Separate access would be provided to the office and operations center. This access roadway could be used to access the CMF. Parking would be provided at the TCC and NTOC for their personnel.

6.8 EXISTING FACILITIES

There are no existing facilities to support railroad operations. Any existing facilities are related to the GROA.

6.9 DRAWINGS

- Figure 6-A. EOL Yard

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

7.1 LOCATION, PURPOSE, AND FUNCTION

Maintenance of the track, bridges, tunnels, culverts, grade crossings, signal equipment, communications equipment and other wayside facilities and equipment would be performed and coordinated from the MOW Headquarters Building. In addition, the staff at the MOW headquarters building would be responsible for responding to rail related accidents, derailments where the track conditions may have been compromised, and to assist in the coordination of activities which may require recovery of locomotives, rail cars, casks and other equipment that have been derailed from the track.

The MOW trackage facility includes a building for administrative purposes, inside storage of spare parts and small tools, shop area; and outside storage area for heavy materials (ties, rail, ballast, etc.) and storage of large on-track track maintenance machines. The MOW trackage facility has access to the mainline for the handling of rail cars carrying heavy and bulk materials, and movement of on-track maintenance machines.

Additionally, there are satellite MOW facilities located at EOL facility and the staging yard. These satellite facilities function in a manner similar to the MOW trackage facility but on a smaller scale. The satellite MOW areas are described in the discussion of the facility with which they are associated.

7.2 BASIS OF DESIGN

7.2.1 Functional Parameters

- 50-year life
- Storage tracks for track maintenance equipment, ballast cars, and crew cars
- Track, bridge, and signal materials, and other construction and maintenance material lay down storage area
- Road access from public highway
- Site approximately six acres
- Facility and a siding to be co-located in order to maximize operational flexibility
- Utilities required include water, electrical power, phone, radio communications, broadband internet access, and sanitary sewer (septic system), natural gas or propane.
- Central location of facility to be the MOW headquarters with satellite MOW facilities located at the EOL and staging yards, and a MOW trackage facility with access to the mainline.
- Roadway access
- Early construction of facilities to support construction of the rail line

7.2.2 Assumptions

- MOW headquarters facility will provide for:
 - General office space for administrative functions and crew functions
 - Toilet, wash, and locker/shower facilities
 - Private offices for approximately five staff
 - Break/lunch room

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

- Conference room
- Shop area/inside storage
- Parking for employee and CRC vehicles
- Material storage areas
- MOW trackside facility will provide for:
 - General office space for administration and crew functions
 - Lunch/break room
 - Locker/shower, toilet, wash facilities
 - Temporary facilities to support construction activities
 - Storage and maintenance of on-track rail equipment
 - Parking for employee and CRC vehicles
 - Hi-rail vehicle access to main track
 - Outside storage area for materials
 - Yard tracks for MOW purposes including handling of ballast trains
 - Track access to mainline

7.3 TRACK LAYOUT

As shown on the site plans the following tracks make up the MOW trackside facility would have a rail yard and access to the mainline:

- Maintenance storage tracks
- Material storage tracks
- Ballast car storage track
- Siding track

There are no tracks associated with the MOW headquarters facility.

7.4 BUILDINGS

7.4.1 Buildings and Functions

MOW Headquarters Building – This building houses the supervisory and administrative staff of the maintenance organization. Also, track, signal, and communications maintainers would be based at this location. The building would also have space for the storage of spare parts, tools, and small track maintenance machines. Parking would be provided for the hi-rail and other trucks associated with the maintenance activities. Maintenance staff based at the building would be responsible for about two-thirds of the total route. The approximate dimensions for the building are 95 feet wide by 140 feet long, occupying approximately 13,300 sq ft.

MOW Trackside Building – This facility would accommodate heavy maintenance and construction materials and track mounted maintenance machinery and equipment. The building would contain administrative, welfare, and shop/storage spaces. The shop/storage space would be for parts inventory,

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

tools, and small track maintenance machinery. The approximate dimensions of the building are 70 feet wide by 140 feet long, occupying approximately 9,800 sq ft. The total site including outside storage and yard tracks occupies about six acres.

7.4.2 Space Sizing Tables / Concept Configuration Footprints

An individual facility spreadsheet, “space sizing table”, was created by assigning an appropriate square feet allocation for each assumed staffing position. The square feet assignments were included under four functional space categories – Administrative (or Administrative/Crew Change), Welfare, Shop/Storage, or Utility. (Refer to 3.1.3 Staffing / Sizing, for further explanation of the methodology and processes for determining sq ft allocations.)

Once a square feet total was determined for each functional category shown in the space sizing table, “blocks” of space indicating the total approximate square feet required were arranged together to form a footprint of how the space might be conceptually laid out. The block diagram is provided as a supplement with each space sizing table and is shown as the concept configuration footprint. (Refer to 3.1.2 Buildings, for further explanation of the methodology and processes for creating the space sizing table and concept configuration footprint.)

Each area on the concept configuration footprint is assigned a color which correlates with the respective functional space category shown on the space sizing table: Administration (Green), Welfare Space (Blue), Shop/Storage (Yellow) and Utility (Orange). For simplicity, areas in plan view are shown as rectangular in shape. For the purpose of this layout, block arrows are shown as an indication of possible entry/egress points that may be required. Also, a grid based on a spacing of 25 feet to 30 feet to indicate a potential future structural framework for the building, provides a logical starting point for the conceptual arrangement.

See the following space sizing tables and concept configuration footprints for the MOW headquarters and trackside facilities:

- Table 7-A. CRC MOW/Headquarters Facility–Space Sizing Table
- Figure 7-A. CRC MOW/Headquarters Facility–Concept Configuration Footprint
- Table 7-B. CRC MOW/Trackside Facility–Space Sizing Table
- Figure 7-B. CRC MOW/Trackside Facility–Concept Configuration Footprint

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

Table 7-A. CRC MOW Headquarters Facility-Space Sizing Table

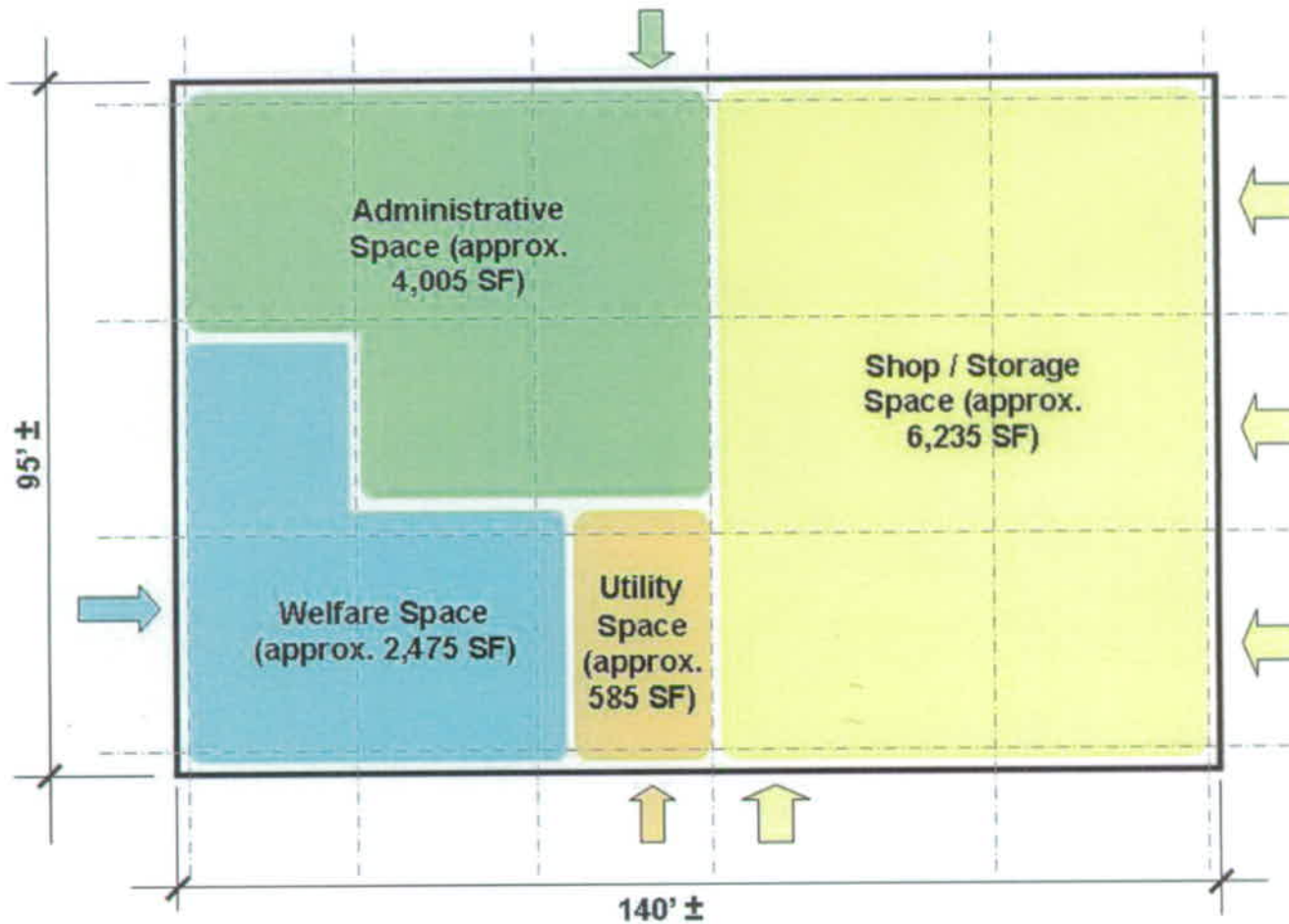
	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE SPACE	Director Office - Engineering and Mechanical	300	
	Track and Structures Maintenance Supervisor	150	
	Storekeeper - Track and Structures	150	
	Signal and Communications Maintenance Supervisor	150	
	Building Maintenance Supervisor	150	
	Track and Structures Maintenance Staff / Crew	720	On-duty point space based on (15) personnel sharing (9) workspaces at 80 sq ft per workspace - see shift assumption for sharing spaces
	Building and Maintenance Carpenters	80	On-duty point based on (2) personnel sharing (1) workspace at 80 sq ft per workspace - see shift assumption for sharing spaces
	Signal and Communications Staff	640	On-duty point based on (13) personnel sharing (8) workspaces at 80 sq ft per workspace - see shift assumption for sharing spaces
	Administrative Storage, Filing and Supplies, Personal Protective Equipment Storage	180	
	Reception Area	150	
	Circulation at 20 percent	535	
	Contingency at 25 percent	800	Can accommodate required space for security personnel or additional administrative personnel that may need to be added
	Total Net sq ft for Area	4,005	
WELFARE SPACE	Men's Locker	150	Full height lockers; assumes 75 percent staff are male of (30) total lockers required = (23) lockers; round up to (25) lockers @ 6 sq ft per person = 150 sq ft
	Men's Shower	65	Assumes (2) showers total - 40 sq ft for ADA shower and 25 sq ft for typical shower; assumes 75 percent male staff.
	Men's Restroom	175	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 13,300 sq ft divided by 200) = (67) occupants with a 50/50 split Men/Women (34 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (1) standard toilet at 25 sq ft, (1) urinal at 15 sq ft, (1) lavatory at 15 sq ft. Add (2) urinals and (1) lavatory assuming that male staff is 75 percent while female staff is 25 percent. (Circulation is included in group total below)
	Women's Locker	60	Full height lockers; assumes 25 percent staff are female of (30) total lockers required = (8) lockers; round up to (10) lockers @ 6 sq ft per person = 60 sq ft

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

Table 7-A. CRC MOW Headquarters Facility–Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA shower; assumes 25 percent female staff.
	Women's Restroom	110	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 13,300 sq ft divided by 200) = (67) occupants with a 50/50 split Men/Women (34 women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (2) standard toilets at 25 sq ft, (1) lavatory at 15 sq ft. (Circulation is included in group total below)
	Lunchroom/Breakroom	750	Based on the largest shift at (23) total staff; round up to (25) at 30 sq ft person = 750
	Conference Room/Training	300	Room will seat (15) @ 20 sq ft per person
	Circulation at 20 percent	330	
	Contingency at 25 percent	495	
	Total Net sq ft for Area	2,475	
SHOP/ STORAGE	Receiving and Shipping Room	150	
	General Shop / Storage	4,825	
	Contingency at 25 percent	1,260	
	Total Net sq ft for Area	6,235	
UTILITY	Electrical Room	100	
	Mechanical Room	200	
	Utility / Janitor Closet	60	
	Telephone / Data Room	25	
	Circulation at 20 percent	80	
	Contingency at 25 percent	120	
	Total Net sq ft for Area	585	
	Total Gross Square Feet	13,300	

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities



Concept Configuration Footprint

Not to Scale

Figure 7-A. CRC MOW Headquarters Facility–Concept Configuration Footprint

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

Table 7-B. CRC MOW/Trackside Facility-Space Sizing Table

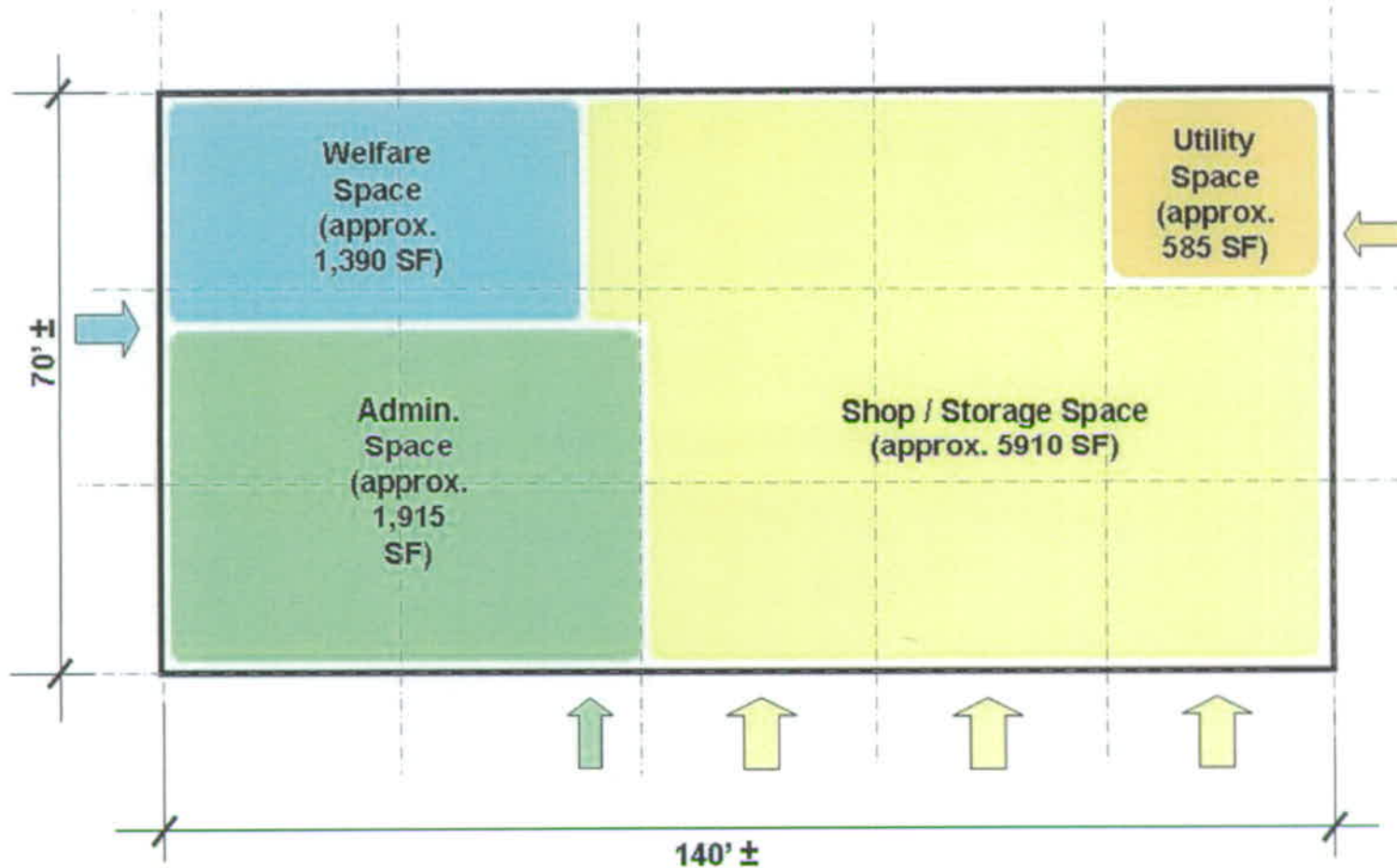
	Staffing / Room Functions	Square Feet	Methodology / Assumptions
ADMINISTRATIVE SPACE	Track and Structures Maintenance Staff / Crew	315	Sized for periodic staffing - assume that 50 percent of staff (from Off Track location - 17 personnel) would be at the facility at any given time. Size for (9) staff at 35 sq ft per person.
	Signal Staff / Crew	350	Sized for periodic staffing - assume no more than 50 percent of communications staff (from Off Track location - 13 personnel) would be at the facility at any given time. Size for (7) staff at 50 sq ft per person.
		300	Task 15 does not address a split MOW facility. All of the supervisors will reside at the MOW Off Track facility but the Trackside facility may require administrative staff. Assume that up to (3-6) administrative staff may be necessary. Assume 50 sq ft per person = 300 sq ft.
	Administrative Storage, Filing and Supplies	60	
	Reception area	250	
	Circulation at 20 percent	255	
	Contingency at 25 percent	385	Can accommodate required space for security personnel or additional administrative personnel that may need to be added
	Total Net sq ft for Area	1,915	
WELFARE SPACE	Men's Locker	75	Full height shared lockers; assumes 75 percent staff are male; 75 percent of (16) total lockers required = (12) lockers @ 6 sq ft per person = 72 sq ft
	Men's Shower	65	Assumes (2) showers total - 40 sq ft for ADA shower and 25 sq ft for typical shower; assumes 75 percent male staff.
	Men's Restroom	130	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 9,800 sq ft divided by 200) = (49) occupants with a 50/50 split Men/Women (25 Men). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (1) standard toilet at 25 sq ft, (1) urinal at 15 sq ft, (1) lavatory at 15 sq ft. Add (1) urinal and (1) lavatory assuming that male staff is 75 percent while female staff is 25 percent. (Circulation is included in group total below)
	Women's Locker	25	Full height shared lockers; assumes 25 percent staff are female; 25 percent of (16) total lockers required = (4) lockers @ 6 sq ft per person = 24 sq ft
	Women's Shower	40	Assumes (1) shower total - 40 sq ft for ADA

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

Table 7-B. CRC MOW/Trackside Facility--Space Sizing Table

	Staffing / Room Functions	Square Feet	Methodology / Assumptions
	Women's Restroom	110	Based on occupant load of building not actual occupants. Using the UBC (ICBO 1997), assumes Group B occupancy (Office) at 200 sq ft per occupant (approx. 9,800 sq ft divided by 200) = (49) occupants with a 50/50 split Men/Women (25 women). Per UBC Table A-29-A, the minimum required is: (1) ADA toilet at 45 sq ft, (2) standard toilets at 25 sq ft, (1) lavatory at 15 sq ft. (Circulation is included in group total below)
	Lunchroom/Breakroom	480	Based on (16) total staff at any one time at 30 sq ft person = 480 sq ft
	Circulation at 20 percent	185	
	Contingency at 25 percent	280	
	Total Net sq ft for Area	1,390	
SHOP / STORAGE	Shipping and Receiving Room	150	
	Shop / Storage	4,575	
	Contingency at 25 percent	1,185	
	Total Net sq ft for Area	5,910	
UTILITY	Electrical Room	100	
	Mechanical Room	200	
	Utility / Janitor Closet	60	
	Telephone / Data Room	25	
	Circulation at 20 percent	80	
	Contingency at 25 percent	120	
	Total Net sq ft for Area	585	
	Total Gross Square Feet	9,800	

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities



Concept Configuration Footprint

Not to Scale

Figure 7-B. CRC MOW/Trackside Facility—Concept Configuration Footprint

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

7.5 SITE LOCATION

MOW Headquarters Facility – The location for this building has been identified approximately five miles south of Tonopah, on the east side of US Highway 95.

MOW Trackside Facility – The site for this facility would be located approximately 18 miles south from US Highway 6 on AR 504; close to the boundary of the NTTR in the vicinity of Reed's Ranch. The facility would be located to the west, and in close proximity to, AR 504. AR 504 is a paved road.

7.6 UTILITIES

Both sites require power, water, propane or natural gas, water treatment and sewage systems. It is assumed that all locations would use commercial electric power with diesel powered stand by generators. Water would be obtained from locally drilled wells. Propane or natural gas would be obtained from onsite storage tanks. Water treatment and sewage would be handled by local treatment systems.

7.6.1 MOW Headquarters Facility

Storm Drainage – This facility consists of about 2.6 acres of buildings and paved areas and about 0.6 acre of unpaved areas. A runoff rate of 0.2 cfs was computed from these areas, and a 24-hour capacity was used. Assuming a 6-foot-deep detention pond, approximately 0.1 acre would be needed. Since this area is so minor, it may be preferable to use a local drainage facility, if available, or a prefabricated drainage basin.

Water (Domestic & Fire) – Domestic water consumption for this site is estimated at 3,000 gpd, based on an average of 50 gpd per occupant. A 110,000 gallon tank would be needed for fire protection, based on building square footage and assuming a one-hour flow period with a 20 percent safety factor.

Sanitary Sewer – Conservatively using the same calculations as domestic water usage, this site would produce an estimated 3,000 gpd. No separate industrial waste is expected to be generated from operations at this facility.

Electrical Power – The MOW headquarters facility is estimated to have a normal power demand of 406 kilowatts.

7.6.2 MOW Trackside Facility

Storm Drainage – This facility consists of about 8.6 acres of buildings and paved areas and about 104.0 acres of track and unpaved areas. A runoff rate of 3.8 cfs was computed from these areas, and a 24-hour capacity was used. Assuming a 6-foot-deep detention pond, approximately 1.3 acres would be needed.

Water (Domestic & Fire) – Domestic water usage for the MOW trackside facility is estimated at 2,500 gpd based on an average of 50 gpd per occupant. A 100,000 gallon tank would be required for fire protection, based on building square footage and assuming a one-hour flow period with a 20 percent safety factor.

Sanitary Sewer – Using the same calculations as for domestic water usage, this site would produce an estimated 2,000 gpd. Included in this amount is an unknown quantity of industrial waste generated from operations at this facility.

Electrical Power – The MOW trackside facility is estimated to have a normal power demand of 78 kilowatts.

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

7.7 ACCESS AND ROADS

MOW Headquarters Facility – Located adjacent to US Highway 95, no additional access roads would be required. Appropriate paved driveways would be provided.

MOW Trackside Facility – The site is proximate to where AR 504 (NTTR Access Road) crosses the alignment. An access road would connect the facility to AR 504.

7.8 EXISTING FACILITIES

Paved roads and commercial electrical power are in proximity to both sites.

7.9 DRAWINGS

- Figure 7-C. CRC MOW Trackside Facility
- Figure 7-D. CRC MOW Headquarters Facility
- Figure 7-E. CRC MOW Headquarters Facility Concept Building Rendering

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

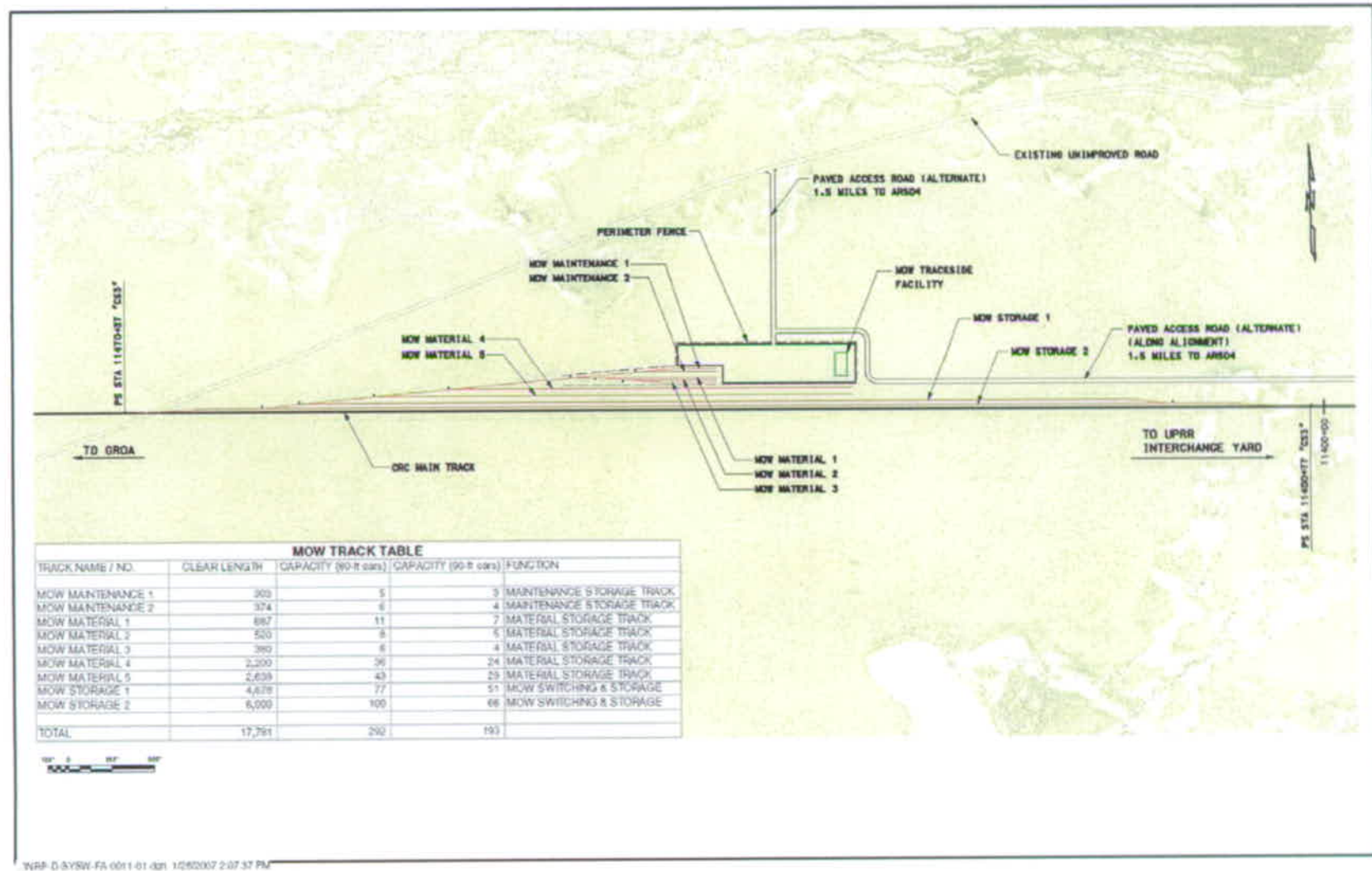


Figure 7-C. CRC MOW Trackage Facility

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

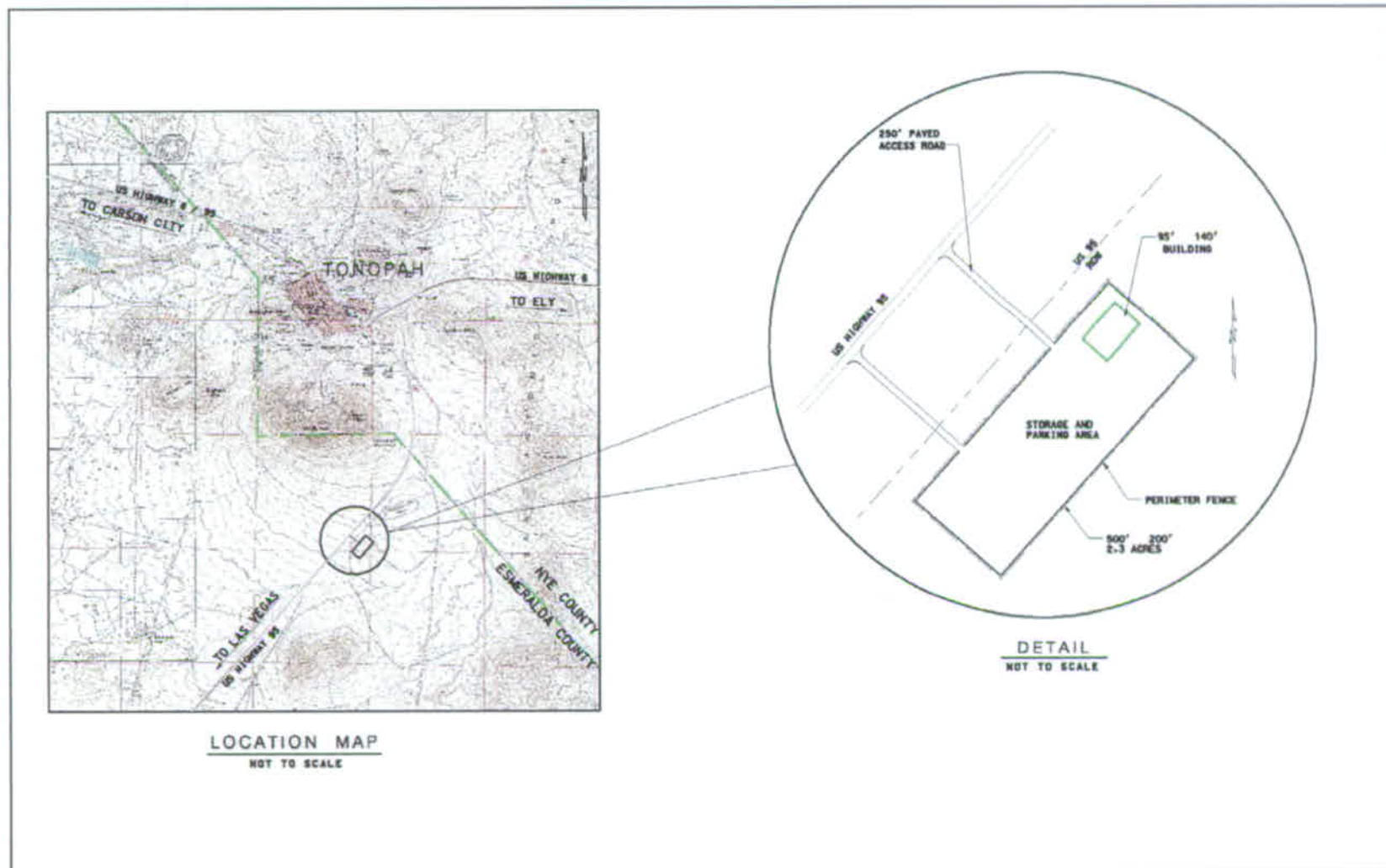


Figure 7-D. CRC MOW Headquarters Facility

7.0 Caliente Rail Corridor Maintenance-of-Way Facilities

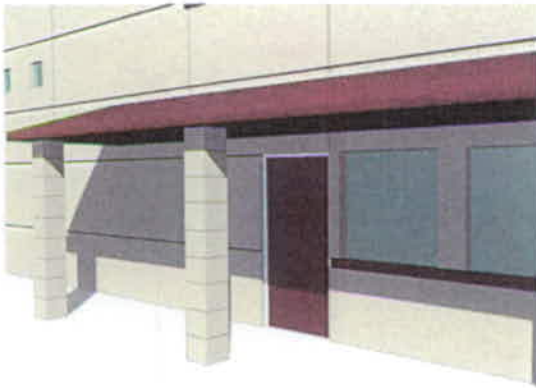
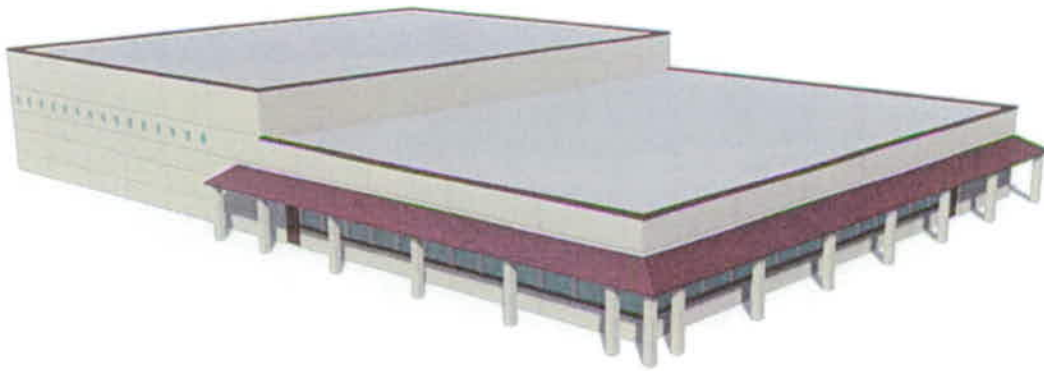


Figure 7-E. CRC MOW Headquarters Facility Concept Building Rendering

8.0 References and Applicable Documents

ICBO. 1997. *Uniform Building Code*. ICBO.

NRP. 2006. *Engineered Plan & Profile Drawing Set, Caliente Rail Corridor*. Las Vegas, NV: NRP.
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